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Paper Men Discuss Washington Conference

Large Number of Paper Mill Executives From All Over the Country Attend First Open Meeting of the American Paper and Pulp Association Held in Chicago in Many Years—President Sensenbrenner Says Paper Industry Has Spent Millions in Improvements in the Last Year But Is Still Behind $100,000,000 in Its Program

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., November 25, 1935.—A splendid presentation by Clark Everest concerning invitation of the paper industry to attend the Washington conference on December 9 as called by Major George Berry and with respect to a possible continuation of some phases of the NRA, featured the open meeting of the American Pulp and Paper Association which attracted over 100 paper executives to the Drake Hotel, Chicago, on November 20.

First Chicago Meeting in Many Years

A thorough explanation of the services of the association with particular reference to a broad and far reaching legislative program; an interesting and constructive opening address by President F. J. Sensenbrenner and an analysis of the grading activities of the association were coupled with a discussion of the import and tariff situation to make the meeting outstanding in many respects. It was the first open meeting held by the association in Chicago for many years according to Secretary Boyce but did follow two successful open meetings held in New York which aided materially in consolidating the work of the association.

Mr. Everest's remark with respect to the Washington conference obviously presented the key purpose of the Chicago meeting—to get approval of executive action relative to the proposed business confab. He read the brief prepared by the executive committee of the association which, at the request of President Sensenbrenner, is not to be made public or otherwise publicly discussed until the actual conference itself. However, it would seem to be no violation of trade journal ethics to say that the association plans to be represented at the conference but with certain reservations as contained in the brief itself. The actions of the executive committee were approved and it remains to be seen as to just what reservations the industry will make when December 9 comes around.

Opening Remarks by President Sensenbrenner

In his opening remarks Mr. Sensenbrenner stated that one of the major items of business was the consideration of whether or not the industry should go to the above mentioned conference. The leader of the APPA stressed the need that industry should participate in legislative matters and concentrate on obstacles that must be overcome before the industry can advance a great deal further. Perhaps he gave an inkling of the feeling of the industry with respect to governmental participation in business affairs when he said that the industry's main task was to put its shoulder to the wheel and iron out its own problems. Mr. Sensenbrenner stressed the work done by a public affairs committee headed by Norman Wilson with respect to RFC loans and stated his belief that the RFC would not act hastily in the future in loans to industries or governmental agencies that might seriously handicap the paper industry. However, he reverted back to his original statement that the major item was to determine whether or not the paper industry wanted NRA or some other type of legislation or no additional legislation and a continuation of the "breathing spell." He granted that the industry improved during the NRA tenure but suggested that the industry satisfy itself as to who did the job of improving.

Discusses Canadian Reciprocal Tariff

Mr. Sensenbrenner then briefly discussed the Canadian reciprocal tariff saying that Counsel Whitney, representing Mr. Wilson, would take that matter up further. He did say that such a tariff might open the way to an actual 25 per cent reduction on the duties of some lines. The dangers of reduction in import tariffs generally were stressed, particularly in view of the higher wage rates and shorter hours within domestic industries.

The leader of the APPA then quoted a number of statistics to point out improvement within the industry, notably that the paper industry's volume is now 75.8 per cent of capacity as compared to a year ago—an eleven per cent betterment. Prices, he declared, were about the same and the profits had been made and were being made out of increased volume. Wages have gone up and a good record has been made, according to Mr. Sensenbrenner. He added however "that whether or not the industry can come back just with the volume and without an increase in prices is doubtful." He added that "the increase in volume is reaching the saturation point and the immutable laws of supply and demand."

Meanwhile, the APPA president said, millions of dollars were being added to the costs of doing business, the Social Security Act in itself adding ten to fifteen million dollars in labor costs. Mr. Sensenbrenner suggested that any price increases must be soundly based and injected into the busi-

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Paper Chemistry Institute Plans Additions

Size of Present Structure At Appleton, Wis., to be Doubled—Building Will Be Extended and Machine Room Added to Accommodate Machinery and Other Semi-Commercial Facilities for Large-Scale Experiment Work and Teaching

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., November 25, 1935—Additions costing approximately $75,000, practically doubling the size of the structure as it now stands, will be made to the Institute of Paper Chemistry, Appleton, Wis. The contract has been awarded to Ben B. Ganther of Oshkosh, Wis., and work is to be started at once. The present Institute building will be extended, and a machine building will be added.

When completed, the buildings will be in the form of a hollow square. The present west wing of the Institute will be extended forty feet; to the south wall of it will be added the machine building, extending an additional 40 feet south, and 114 feet east. The rear facade of the completed group will then be the same length as the front facade. Lannon stone will be used for the exterior, to conform to the present buildings. The interior finish, trim and furniture will correspond to that of the present quarters.

The new west wing will consist of two stories and basement. It will house lockers, special laboratories and service rooms, the latter in the basement. Offices and research laboratories of Dr. Otto Kress, technical director, will be on the first floor. Other offices also will be located there, and the second floor will contain research and student laboratories.

In the machine building, there will be a floor two stories high to accommodate machinery and other semi-commercial facilities for large-scale experiment work and teaching. The basement will house storage rooms, boiler room, machine shop and additional laboratories.

Work of the Institute, especially in the field of commercial research has grown to the point where enlargement of physical facilities were necessary, Dr. H. M. Wriston, president of Lawrence College and director of the Institute, announced. There has been a need for some time of complete paper making machinery so as to teach students all processes.

In his semi-annual report to the board of trustees of Lawrence College, Dr. Wriston said the Institute closed its fiscal year in good condition, balancing its budget at approximately $225,000. It has continued to enlarge its staff, and has found more effective means of organizing research and instruction. It is rapidly maturing in function and point of view. More large corporations have become interested in its program, and as a result it has gained additional support and a still stronger position nationally. Bequests for endowment purposes now total $21,340, the report stated.

Fox River Valley Mills Active

A general pickup has been noted in the paper industry of the Fox River Valley, a recent survey among mill officials reveals. Business held up better in this section during the depression than in most other parts of the country, and there has been a noticeable improvement in the last nine months. The increase has averaged 13 per cent in that period over a year ago, especially in the finer grades.

Many of the mills have returned to the eight-hour day basis, finding that production under increased demand was unsatisfactory under the six-hour day plan adopted under NRA codes. Employees also prefer the eight-hour shift because the pay is larger over the weekly periods.

Most manufacturers express confidence that the increase will be sustained, since orders from some of the large basic industries are growing.

Miniature Paper Machines Exhibited

Miniature paper machines in operation at the Milwaukee and Wisconsin Exposition at the Auditorium at Milwaukee, Wis., last week proved an interesting demonstration to thousands who viewed the exhibits of Wisconsin products and their methods of manufacture.

Motion pictures were used by Hummel and Downing Company, Milwaukee, to show the steps involved in the making of paper boxes. The films showed the processing of pulp into fiber board, its journeys over the paper machines, and its fabrication into boxes. Creasing, slotting, printing and stitching also were shown. The pictures also showed the extent of reclamation of waste paper, which saves 75 per cent in the conservation of national forests. The forestry department estimates 75 out of every 100 trees in the forests are thus saved by the vast waste paper collecting industry of the United States.

Protest Sewage Disposal Plant

Paper mills at Kaukauna, Wis., have filed objections with the city council to the erection of a sewage disposal plant costing $140,000, to include industrial waste. The protests were made by Karl Karlson, resident manager of the Union Bag and Paper Company; and K. E. Stansbury, vice-president, and C. R. Seaborne, general superintendent, of the Thilmany Pulp and Paper Company. They declared their companies could not assume the burden of heavily increased taxes for the plant's construction, and also pointed to the impracticability of handling mill waste in the sewage plant. Black liquor, they declared, would have to be treated by the mills themselves at a great expense before delivery to the sewage plant, bcause it would harden and impair the system. Mr. Stansbury estimated his company would have to pay at least 20 per cent of the total cost of the plant. Mr. Seaborne announced that the Thilmany mill is installing save-all machines to reclaim the white water, and is not prepared to run any of the black liquid into the sewage plant.

News of the Industry

Frank P. Vaughan, of the Bay West Paper Company, Green Bay, Wis., was re-elected president of the Wisconsin State Chamber of Commerce at its annual meeting at Milwaukee, Wis., last week. Charles S. Boyd, president of the Appleton Coated Paper Company, Appleton, Wis., was elected to the board of directors, representing district No. 3.

Alan Hackworthy, assistant sales manager of the Menasha Products division of the Marathon Paper Mills, Menasha, Wis., has resigned. He has accepted a position with the Securities Company, Milwaukee, Wis., in the state department. He and Mrs. Hackworthy will reside at Wauwatosa, Wis.

A paper maker has plenty of troubles. Even under the best of circumstances they are too many to enumerate. Many of them cannot be avoided. One, however, can be entirely eliminated.

How often are mills shut down waiting for replacements? How much money is lost by these shut-downs? How many dispositions are ruined? How many pay envelopes are thinned?

The expense involved in carrying an adequate supply of spare fly bars, bedplates, and rag knives is nothing in comparison with that of a shut-down. The Dilts Machine Works, who build the beaters in which your paper is made, also make fly bars, bedplates, and rag knives. We feel that the quality of our labor and materials is second to none. Past experience justifies our saying that we can help you. May we do so?

— Dilts —

MACHINE WORKS Inc. FULTON, N.Y.

"Your Paper Is Made in Your Beaters"

Canadian Paper Industry More Optimistic

Reciprocity Agreement Between United States and Canada Assures Free Entry for Newsprint Paper for Next Three Years, At Least—Prevailing Demand for Newsprint In Record Volume—Threatened Price War May Be Averted

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., November 25, 1935—Three factors have contributed to a better feeling in the newsprint industry during the past week. One is the stability given by the reciprocity agreement between the United States and Canada whereby newsprint is assured of free entry to the United States for the next three years; the second is the fact that the demand for Canadian newsprint is now in record volume; the third is that there are good grounds for believing that the price war, which was threatened by the resignation of the Great Lakes Paper Company from the Newsprint Export Manufacturers Association will be averted. As a direct result of these developments, strength and activity have been manifested in the "paper" group on the Montreal Stock Exchange, with advances in the prices of the securities of such newsprint manufacturing companies as Consolidated Paper, Lake St. John, Price Brothers, Fraser, Restigouche, Minnesota and Ontario, Canadian International, Donnacona and Abitibi.

No Intention of Breaking Market

Satisfaction is expressed here at a public announcement by the National Trust Company, as receiver and manager for the Great Lakes Paper Company, that while it reserved the right to pursue an independent sales policy following its resignation from the Newsprint Export Manufacturers' Association, it had no immediate intention of breaking the market for newsprint which has been fixed at $41 a ton for 1936 by the Great Northern Paper Company.

Hope Price Cutting Can Be Avoided

With production and sale of newsprint at the highest level in the history of the industry in Canada during October, thus indicating the wide improvement in the statistical position that has developed in the past year, the financial community is optimistic on the outlook for the industry, provided a renewal of price-cutting tactics can be avoided. Outside of Great Lakes, whose defection from Nemac was occasioned by the opposition to the Gefael plan, the industry is in better shape today, in so far as the marketing situation is concerned, than it has been for some years, and hopes are now entertained that the mid-western producer will refrain from wrecking the price structure.

Parliment To State What Newspaper Is

What a newspaper is, within the meaning of the law, has still to be defined in Canada. Curiously, the statutes of Canada contain no definition of the term and in consequence the Dominion Treasury, by a judgment of the Supreme Court just delivered, is out about $5,000. The sum is not large but the principle is considered of sufficient importance to have an interpretation Act amendment next session to clarify the point. Newspapers are exempted from the sales tax. The Montreal Stock Exchange claimed like exemptions on its daily record of transactions. The Exchequer Court held that this record is a "newspaper." The Government appealed and the Supreme Court has now confirmed the judgment. The record of transactions in question being published in the newspapers as news, it was contented that separate publication is also a "newspaper." This was contrary to the contention of the Justice Department. The records of all stock exchanges of course, are affected by the judgment. Consequently, there will be a legal definition by statute of what a newspaper really is.

Sharp Increase in Newsprint Exports

A report by the Dominion Bureau of Statistics just released shows that in October newsprint exports amounted to 4,808,421 cwt., as compared with 4,098,083 in October, 1934, the value being $8,178,485, as compared with $6,958,945, a gain of $1,219,900. For the seven months to the end of October, the exports amounted to 30,313,600 cwt., valued at $51,663,116, as compared with 27,475,040 cwt., valued at $46,942,590 in the similar period of last year.

The value of wood pulp exported in October amounted to $2,268,586, as compared with $2,260,164 in October, 1934, and the value of pulpwood exported amounted to $899,014, as compared with $690,825.

Canada last month exported 138,118,000 feet of boards and planks valued at $2,842,419, compared with 123,849,000 feet in October last year valued at $2,496,969. The United Kingdom took $1,510,573 worth. It was the largest purchaser. The United States came second with $860,075 worth.

Paper and Industrial Appliances, Inc. Report Repeat Orders for Hydraulic Beating Systems

Two Western board mills have each ordered another installation of the Hydraulic Beating Systems for handling filler stock in manufacturing high grade boards.

This new equipment as manufactured by Paper and Industrial Applicances, Inc. of New York, revolutionizes the treating of waste paper stocks by definitely removing the Difficulties which have been heretofore encountered because of the many variables of the raw materials, fibers, and impurities.

Reseaches and actual mill operation have satisfactorily proved the effectiveness of this system, making it possible to increase production on paper machines.

Paper and Industrial Appliances, Inc. also reports a new installation of this system by a Western mill for manufacturing test liner.

Waste Disposal in Wisconsin

The meeting on November 8 and 9 of technical representatives of Wisconsin Paper Mills with representatives of the Wisconsin State Board of Health was the most satisfactory meeting in recent years from the viewpoint of the mills. First, uniform good water in the rivers of Wisconsin this past year had eliminated practically all complaints of pollution from fishermen and, second, construction activity by most mills in closing up white water systems had shown lower stream pollution by these mills in this last summer's survey by the States.

Plans for 1936 were laid which include continued stream surveys, mill sewer surveys, a drive for routine control testing of mill sewer effluents, and considerable work on proving of waste sulphite liquor recovery processes.

The experience of others suggests

GILMER V-Belts

INDUSTRY has found by experience that Gilmer V-Belts are outstanding . . . in design . . . in construction . . . in *performance!* Full-moulded and made to fit and grip V-grooves . . . and sturdily built of carefully selected fabrics and three compositions of tough, flexible heat-resisting compounds . . . they are free from wasteful slipping, maintain sufficient stretch and always run "cool". They transmit steady and maximum power at all times.

Their performance on heavy-duty Triplex pump drives in oil fields; on conveyor drives in coal mines; on Fourdrinier drives in paper mills; on fractional horse power drives in electric refrigerators, washing machines, and small utility tools and devices, emphatically suggest Gilmer V-Belts for every type and size of V-drive where power must be transmitted quietly, efficiently and economically.

KABLE KORD FLAT BELTING

On flat pulleys for group drives, short centers and pivoted motor bases, Kable Kord transmits more pull per square-inch than any other flat belt made. Comes endless and in rolls.

L. H. GILMER COMPANY

TACONY, PHILADELPHIA

Manufacturers OF COMPLETE LINE OF POWER BELTING

V-belts · Kable Kord Roll and Endless Flat Belting · Planer Belts · Speedage Endless Fabric Belts · Cone Belts
Roving Frame Belts · Moulded Rubber Belts · Winder Belts · Spinner Belts · Refrigerator and Washing Machine Belts
Conveyor Belts · Round Roll and Endless Fabric Belting · Endless Belting · Endless Cotton Belts · Laundry Feed Ribbons

SPECIALISTS IN QUALITY BELTS SINCE 1903

Demand for Paper Fairly Persistent in Boston

Prevailing Request for Various Standard Grades of Fine Paper Somewhat Irregular—Good Volume of Orders Being Received for Wrapping Paper—Competition Is Keen, However, and Profits Light—Paper Stock Market Stronger

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 25, 1935—Business in wholesale paper houses in the Hub ran from fair to very good during the week under review. Although in some quarters of the fine paper market the demand was not so active as it had been, the majority made favorable statements. In wrapping paper there was a particularly good volume of orders, but the complaint was made by some that there was not much profit. Competition was very keen. Box board was rather quiet, although the call for material for shoe cartons was fairly satisfactory. It is expected that the shoe business will be more active early in December.

The paper stock market generally was rather active. Under old papers, mixed papers and old newspapers moved fairly well, with values unchanged. Bagging was strong and very active, price advances taking place in several grades. Foreign manila rope rose to 2.10@2.25 from a flat 2.10; jute carpet threads to 1.00@1.10 from .65@.70; foreign scrap burlap to 1.95@2.00 from 1.85@1.90; scrap sisal to 1.75@1.85 from 1.50@1.60; scrap sisal for shredding to 1.85@2.00 from 1.80@1.90, and paper mill bagging to 1.25@1.35 from a flat 1.25.

New domestic rags were in considerable demand, with values appreciating in a number of cases. New white No. 1 shirt cuttings advanced to .06¾@.07 from .06@.06¾; soft unbleached to .06¾@.07; blut cheviot to 5.25@5.50 from 4.65; khaki cuttings to .04@.04¼ from .03¾@.04, and O. D. khaki to .04@.04¼ from .03¾@.04. Old domestic rags were rather dull, especially in roofing stock, although prices remained unaltered. There was less importation of foreign rags, with the price of dark cottons declining to 1.40@1.60 from 1.55@1.70. New white shirt cuttings, however, advanced to 6.50@6.75 from 5.50@6.00.

New Products Exhibit

At the new products exhibit held at the Hotel Statler November 21 and 22 by the New England Council as a feature of the Tenth Anniversary New England Conference, the Dennison Manufacturing Company, Framingham, Mass., showed decoration papers for window and interior display. These products are paper-like in manufacture, but cloth-like in properties. They include Velure, Lustr-Weav with a metallic finish, Frostex, Tone-Kraft or crepe paper laminated to corrugated board, and Glaz-Craft also laminated to corrugated board. Curtains and draperies of paper also were shown. By combining crepe paper with metallized flat paper a brilliant brocade-like drape is produced, which does not tend to form straight folds. Velvet-like finishes were made by dusting rayon flock on crepe paper. The company displayed also "handy bookshelves," a stamp collector's bookshelf, cartons for sewing kits and handkerchiefs and handy boxes. These are made from an entirely new kind of paper, especially created for this purpose. They hang as gracefully as fine fabric and are surprisingly inexpensive. Colors are reasonably resistant to light fading and will not run when wet. The curtains and draperies are made in various designs and colors.

Bird & Son, Inc., East Walpole, Mass., displayed shingles.

The Plymouth Cordage Company, North Plymouth, Mass., and Welland, Canada, showed new rope products.

News of the Industry

An interesting new series of advertising pieces incorporating electro service to printers is being developed by the Albemarle Paper Manufacturing Company, Richmond, Va., for which Carter Rice & Co., Corp. and John Carter & Co., Inc., are agents. The designs have been made by prominent artists throughout the country, featuring major lines from department stores, hotels, insurance companies, travel companies, tourist agencies, etc. This service will be expanded later.

The Moss Household Cabinet Toilet Tissue, made by the Wheeler Paper Corporation, Albany, N. Y., of which Thomas K. Bradfird, this city, is New England representative, is a new re-sale item, to be sold in department and other retail stores. This paper is an interfold tissue, contained in what is said to be the first type of paper cabinet on the market. The paper is dispensed two sheets at a time. Moss Tissue is white, soft and very absorbent. The packages are of a very attractive light lavender shade, retailing at two for 25 cents.

An exhibit of type face designs is to be held in the new exhibit hall of the Storrs & Bement Company, December 2-21. These designs were submitted in the contest held by the National Board of Printing Type Faces and are the work of designers from all parts of the country. Awards were made for the best faces for advertising, general use and book work. The first prize for book work was awarded to George F. Trenholm, Boston.

Fritz Carmer, of the Poinier-Carmer Company, box board dealers, was in New York last week, visiting various mill connections. On the way he was accompanied by Charles Whittaker, superintendent of the Natick Box and Board Company, Natick, Mass. They attended the annual meeting of the National Box Board Manufacturing Association at the Waldorf, Thursday and Friday.

Clifford F. Ferguson, of Frank C. Meyer Company, Inc., shoe box manufacturers, Lawrence, Mass., who had a heart attack about five weeks ago, necessitating a complete rest, is now able to return to his office for short periods. His many friends wish him a speedy recovery.

Winthrop L. Carter, president and general manager of the Nashua Gummed and Coated Paper Company, was re-elected president of the New England Council at the general session at the Hotel Statler Thursday evening.

Mr. Beach, of the Riegel Paper Corporation, called on the trade last week.

M. Ruchman & Co. To Deal in Waste Paper

INDIANAPOLIS, Ind., November 25, 1935—Articles of incorporation have been filed with the secretary of state here by M. Ruchman & Co., Inc., 840 East Columbia street, Fort Wayne, Ind., formed to deal in waste paper, rags and similar merchandise. The corporation has 1,000 shares of no par value capital stock and the incorporators are Meyer Ruchman, also named resident agent, Frank E. Corbett and Minnette Ruchman.

U.S.-Canadian Trade Pact Received Favorably

Although Officials of Fine Paper Companies Hesitate to Express Opinion, Reaffirmation of Existing Tariff Policy of Newsprint Paper Is Reassuring to Manufacturers In the Dominion—Pulpwood and Wood Pulp Assured Continued Free Entry

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., November 25, 1935—The announcement of the trade pact between the United States and Canada was received with varying degrees of satisfaction in the Canadian paper trade. Fine paper manufacturers are not yet in a position to state just how the Canadian-U. S. agreement will affect their operations. The published particulars of the agreement are too general to allow officials of the big plants to give an opinion.

Concessions to the United States cover practically all the products of the companies. In the case of magazine and paper stocks, the reduction is equivalent to 10 per cent in the duty, which would not make any material difference in the competitive position of the paper manufacturers.

Re-affirmation of existing tariff policy on newsprint imports by the United States is reassuring to Canadian manufacturers who have been somewhat uneasy since the campaign started in the United States for the placing of a duty on newsprint. Any change in the American tariff policy would have been a severe blow to Canadian manufacturers. The United States is by far the largest market for Canadian newsprint and during the past year about $70,000,000 of newsprint was shipped to the United States. Trade which six years ago was valued at $34,000,000, is assured continued free entry into the United States during the life of the trade pact in respect to wood pulp and pulpwood. In addition to pulpwood three types of wood pulp, namely bleached sulphite, ground and soda, are mentioned specifically.

Garden City Replaces Burned Mill

The new converting plant of Garden City Paper Mills Company, Ltd., being built at this time on their Merritton property, adjoining that of their affiliated company, the Canadian Vegetable Parchment Company, Ltd., is nearing completion, and full operations in this modern building should be possible within a few weeks' time. This up-to-date plant is being built to replace the old converting plant which was destroyed by fire in November, 1933. The company was fortunate in being able to secure, immediately after the fire, very desirable space in the Lord & Burnham building at St. Catharines, which permitted of operations being resumed without noticeable interruption, and of being maintained at full capacity continuously to date. When the paper machine is installed in the new adjoining building on the Merritton site, all operations will be consolidated practically under one roof, warranting expectations of increased efficiency and service in all departments. At the old Garden City mill, located on the old canal, it is proposed to make Facial Tissues and Waddings. Remodelling plans are under consideration to that end, and by which, further specialties will be added to the company's already extensive range.

Fort William and Great Lakes Plans

Ontario Government opposition to the Gefaell-Aldich plan for reorganization of the Great Lakes Paper Company, already accepted by the bondholders of the newsprint firm, is interpreted in Fort William as a severe blow at the city's prospects of becoming a big paper production center. Civic authorities have wired the Government expressing strong opposition to Government interference with the present proposition. Prior to the meeting of bondholders city officials said, the Chamber of Commerce of Fort William informed Premier Hepburn and the Hon. Peter Heenan that its chief interest centered in any deal that would assure 100 per cent output at the plant. This, they say, was assured in the offer to the bondholders. The civic authorities feel that in the best interests of the city the deal should go through.

Alterations To Fort Frances Mill

A crew of men are at work enlarging the Church Street watchman's hut of the Ontario and Minnesota Power Company at Fort Frances, for the purpose of converting it into a new time office. When completed the new office, which will form the main entrance to the paper mill, will be moved from its present position in the north-east corner of the mill. Watchmen's huts will be eliminated and supplanted by the erection of the new time office and will better centralize the work of this department. The hut at the north end will be closed and the gate also, except for the eight hours in which trucking will be done, and for that reason the north gate will remain open during the eight hours shift. The new time office will be ready for occupancy shortly.

Paper Company Starts Second Machine

With the announcement by mill officials that the second paper machine has been placed in operation, the mammoth plant at Fort William of the Great Lakes Paper Company, is now operating at full capacity. With both huge paper machines operating on full time and with a general step-up in all departments the big plant presents a scene of great activity. All of the old employees, but no new ones, have been taken on the pay roll. During the present month advantage will be taken of the big stock warehouse, constructed a few years ago at the plant, to load numerous vessels with shipments of paper before the freeze-up. Several vessels are expected to dock at the end of this month with raw materials for paper making. Woods operations on the river have been concluded for the year and the mill has on hand thousands of cords of wood in large piles at the mill. With the mill operating at full capacity it means the consumption of 10,000 cords of wood per month. All of the wood used by the local plant is procured from district woods, it is stated.

More Talk of Paper Merger

More is behind the efforts of Canadian newsprint producers to prevent the Gefaell-Aldich plan for Great Lakes Paper being made effective than the alleged danger to the Canadian price structure, although that is vitally involved. Some time ago statements were made by prominent newsprint interests to the effect that developments vital to the industry where in the making. This is understood to represent consolidation in the industry whereby Ontario and Quebec enterprises would be unified in such a manner that material operating savings would be effected. Under such a plan Ontario units of such a merger would supply requirements of Western American buyers and Quebec units the requirements of the eastern United States. Such a plan, it is pointed out, would involve a saving in freights of some $3 a ton. Great Lakes Paper Company was to come into this picture.

Demand for Paper Maintained in Philadelphia

Evidence of Improvement Noticed In Practically All Standard Grades of Paper—Volume of Wrapping Paper Sales 30 Per Cent Higher In October Than In September—Same Percentage of Increase Over October Last Year

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., November 25, 1935—Business has been well maintained and additional evidence of improvement is being experienced in the increasing demand for paper in many branches of the trade. Wrapping paper sales registered 30 per cent increase for October compared with September, and the same percentage of increase over October of last year.

Association Activities

At the recent meeting of the Philadelphia Paper and Cordage Association, the Nominating Committee, of which James Andrews, of the Schuylkill Paper Company, is chairman, presented the following slate to be voted on at the December meeting: For President — George K. Hooper and E. K. Lay; Vice-President—E. K. Lay and George K. Hooper; Secretary—John J. Shinners of Acme Specialty Sales Company; Treasury—T. C. Manna, mill agent, Drexel Building; Directors — James Andrews, Schuylkill Paper Company; Vincent Dirvin, Paper Manufacturers' and Bankers' Club, Broad and Walnut streets, Corporation; Amos M. Coath, vice-president of Frank W. Winne & Son, and Harry S. Platt, Philadelphia representative for Denney Tag Company.

All-Media Display

George L. Ward, of D. L. Ward Paper Company, 401 North Broad street, has been appointed Attendance Promotion and Hotel Chairman of the New All-Media Graphic Arts Exhibit, which, through the auspices of the Direct Mail Advertising Association, is being held at the Manufacturers' and Bankers' Club, Broad and Walnut streets, Philadelphia. This exhibit follows in the footsteps of the two former traveling exhibits ("49 Ways" and "27 Industries"), which were shown in twenty-five cities during the past two years.

In the All-Media Display, Mr. Ward says: "Instead of restricting this new exhibit to direct mail advertising alone, the association has presented an educational exposition of all forms of advertising. The advantages, the value, the 'talking point' of every form of advertising are presented in a spectacular, convincing and non-comparative way. That is—in presenting newspaper advertising, its value is not compared with radio or direct mail, etc.; in presenting radio, it is not compared in a competitive way with outdoor, newspaper, direct mail, etc.

"The whole purpose is to give a complete, entirely fair and basically impartial picture of each component part of the whole field of advertising, and the association, from its library and with the help of its members and friends, shows how direct advertising ties in with the other forms of advertising. An exhibit has been created which will help business executives to get a clear idea of what is being done by well conceived and co-ordinated advertising.

"In the Exhibit Design, there are ten 15-foot educational sections. Each division symbolizes or dramatizes the advantages of each particular form of advertising—all available and reliable sources of information about the forms of advertising and the possible direct advertising tie-ups with definite reports of actual tie-up cases. On tables placed in front of each section are shown individual specimens of direct advertising — such as letters, booklets, folders, catalogs, broadsides—which have been used in conjunction with a planned campaign in other media.

"There are ten educational units, classified as follows: Outdoor Plus Direct Advertising, Business Paper Plus Direct Advertising, Window Display Plus Direct Advertising, Radio Plus Direct Advertising, Newspaper Plus Direct Advertising, Street Car Plus Direct Advertising, General Magazine Plus Direct Advertising, Business Film Plus Direct Advertising, An Explanation of Direct Advertising, 50 Direct Mail Letters."

Hamilton Sales Campaign

A nation-wide advertising and sales promotion campaign is being launched by W. C. Hamilton & Son, of Miquon, Penna. Joseph H. Dunton, sales manager, who is in charge of this campaign, states it is their intention to feature pre-humidified papers. This campaign will extend through Philadelphia, New York, Baltimore, Washington, New England, the West and as far south as Florida. A master sample book will be distributed this coming week to every printer in Philadelphia, and additional mailing pieces will follow at frequent intervals. Included in this master sample book will be large swatches of each line and a full display of covers and weights of the following brands: Hamilton Bond, Hamilton Ledger, Hamilton Vellum, Old Treaty Bond, Mineopen Bond, Kilmory Book Cover, Victorian Book Cover, Italian Pressed, Cloudweave, Whitemarsh Vellum, Montgomery Offset and Devon Offset.

Thus far W. C. Hamilton & Son have held sales meetings at the Penn-Athletic Club. On Friday last, twenty-three representatives from Whiting-Patterson Company were in attendance; this morning at the office of Walter-Wilcox-Furlong Paper Company, and this evening at the Down Town Club, seventy-five representatives from the Garrett-Buchanan Company were on hand. H. H. Hanson, general manager of W. C. Hamilton & Son, and Frank Howley of Jerome B. Grey Advertising Agency, also spoke at these gatherings.

Infante Partnership Dissolved

Announcement is made of the dissolution of the partnership that heretofore existed in the firm of Infante Brothers, waste paper merchants, located at 333 South Water street. Louis Infante will continue the business at the above address under the name of Louis Paper Stock Company, while his brothers, Dominic and John Infante, will conduct business under the name of International Trading Company and will be located at 334 South Delaware avenue.

P. L. Andrews Corp. Moves Office

The P. L. Andrews Corporation, manufacturers of envelopes and folding boxes, with plant at Glendale, L. I., has removed its sales offices to the Marbridge Building 1328 Broadway, New York City. The new telephone numbers are WIsconsin 7-0280, 0281, 0282.

New England TAPPI Discusses Pulp Tests

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Nonotuck Hotel, Holyoke, Mass., Friday evening, November 22nd. About 70 attended the dinner and a considerably larger number attended the meeting that followed. F. C. Clark presided as chairman and introduced the National Secretary, R. G. Macdonald, and also P. H. Prior of the A. E. Reed Company, Ltd., newsprint and kraft paper manufacturers of England.

To Hear Reynolds and Thompson

The Chairman announced that for the December 20th meeting, which will be devoted to management subjects, L. C. Reynolds of the American Writing Paper Company, will talk on "Water Power in Holyoke and its Relation to the Paper Industry," and Sanford Thompson of Thompson and Lichtner, Boston, will talk on "Quality Control Through Incentives."

James d'A. Clark, Speaker

The principal speaker was James d'A. Clark of the Scott Paper Company, Chester, Pa., who talked on "Technical Control of Paper Making Stock." Mr. Clark pointed out that in general bales of groundwood tend to become wetter on the outside while sulphite pulp bales remain wetter in the center, and consequently when the boring system for pulp sampling is used a one-half per cent shortage may be found for the sulphite and an equal overage for groundwood.

The speaker stated that it is possible to purchase woodpulp on specification and that this is being done at present. The three best methods to use to learn how a pulp is going to act when processed in the mill, are the fiber classification, drainage factor and strength development tests.

These tests were carefully described. A simple screen providing for but two or three fractionations will give the information wanted for fiber classes. A classification can be determined in 20 minutes and all tests should be made in the mill where the results can be immediately used. The drainage factor accurately shows the action to be expected in a jordan. Consistency measurements of the stock in the head box and of the white water from the machine should be made.

Strength development in the kollergang mill was discussed. It was shown that six laboratories using the kollergang obtain quite uniform results which compared favorably with each other. The speaker stated that a sheet having a high tear and a low density is usually a good pulp. A white water sampling device that will take samples that are proportional to the water going over a wire was also described.

Among Those Present

Among those who attended were:

W. L. Vassar, Wheelwright Paper Co., Leominster, Mass.; Frick R. Montonen, Wheelwright Paper Co., Leominster, Mass.; Frank R. Filz, Wheelwright Paper Co., Leominster, Mass.; John P. Kennedy, American Writing Paper Co., Holyoke, Mass.; L. M. Yoerg, American Writing Paper Co., Holyoke, Mass.; Sanford E. Thompson Thompson & Lichtner Co., Boston, Mass.; W. O. Johnson, Strathmore Paper Co., Woronoco, Mass.; Andrew T. Barnett, American Writing Paper Co., Holyoke, Mass.; W. J. Ford, West Dudley Paper Co., West Dudley, Mass.; Thomas Flaherty, American Writing Paper Co., Holyoke, Mass.; R. A. Packard, Smith Paper Co., Lee, Mass.; H. M. Keating, Smith Paper Co., Lee, Mass.; P. W. Ayers, Smith Paper Co., Lee, Mass.

D. K. Bartlett, West Dudley Paper Co., West Budley, Mass.; Philip H. Prior, A. E. Reed & Co., Ltd., Maid Stone, England; Angelo M. Altieri, Fitchburg Paper Co., Fitchburg, Mass.; Ivan A. Yeaton, Dennison Mfg. Co., Framingham, Mass.; Albert C. Lamoureux, Dennison Mfg. Co., Framingham, Mass.; R. J. Proctor, Fitchburg Paper Co., Fitchburg, Mass.; B. Asner, Dennison Mfg. Co., Framingham, Mass.; L. B. Tucker, Crane & Co., Dalton, Mass.; H. A. Otto, American Tissue Mills, South Hadley, Mass.; William J. Glendon, Crane & Co., Dalton, Mass.; John McGarry, Crane & Co., Dalton, Mass.; L. N. Smith, American Tissue Mills, South Hadley, Mass.; R. H. Doughty, Fitchburg Paper Co., Fitchburg, Mass.

John F. Inderdohnen, The Bristol Co., Waterbury, Conn.; W. A. Nivling, Huron Milling Co., Boston, Mass.; Earle C. Davis, Bird & Son, Inc., East Walpole, Mass.; H. T. Barker, Bird & Son, Inc., East Walpole, Mass.; C. G. Hart, Wallace & Tiernan, Boston, Mass.; Harold W. Lavallee, Clinton Co., Holyoke, Mass.; P. S. Bolton, Clinton Co., Boston, Mass.; O. Ojamaki, Fitchburg Paper Co., Fitchburg, Mass.; G. E. Mangsen, Fitchburg Paper Co., Fitchburg, Mass.; James T. Kemp, American Brass Co., Waterbury, Conn.

Claude Smith, American Writing Paper Co., Holyoke, Mass.; George Carroll, American Writing Paper Co., Holyoke, Mass.; William Whiting, Jr., Whiting Paper Co., Holyoke, Mass.; Francis Gillispie, American Writing Paper Co., Holyoke, Mass.; C. Lawrence Reece, Whiting Paper Co., Holyoke, Mass.; S. D. Hellberg, American Writing Paper Co., Holyoke, Mass.; J. E. Doyle, American Writing Paper Co., Holyoke, Mass.; James Fitzgerald, Collings Mfg. Co., North Wilbraham, Mass.; C. J. Backus, Collins Mfg. Co., North Wilbraham, Mass.; M. V. Horgan, American Writing Paper Co., Holyoke, Mass.; Grant Willey, Collins Mfg. Co., Holyoke, Mass.; Walter G. Hendrich, Byron Weston Paper Co., Dalton, Mass.; Herman Grasselt, Collins Mfg. Co., North Wilbraham, Mass.; Helen U. Kiely, American Writing Paper Co., Holyoke, Mass.; Lena E. Kelley, American Writing Paper Co., Holyoke, Mass.

R. E. Kilty, Staley Co., Springfield, Mass.; William L. Foote, B. F. Perkins Co., Willimansett, Mass.; Chester Irving, Fitchburg, Mass.; Roy S. Charron, U. S. Envelope Co., Worcester, Mass.; Charles Davidson, Jr., Whiting Paper Co., Holyoke, Mass.; James d'A. Clark, Scott Paper Co., Chester, Pa., R. G. Macdonald, Secretary TAPPI, New York City; Frank H. Leonard, Marble-Nye Co., Providence, R. I.; Fred C. Clarke, Skinner-Sherman Co., Boston, Mass.; H. E. Crippen, Solvay Co., Boston, Mass.

W. R. Steele, Solvay Co., Syracuse, N. Y.; Stephen Stapley, Chemical Paper Co., Holyoke, Mass.; John Browne, Chemical Paper Co., Holyoke, Mass.; Roger C. Griffin, A. D. Little Co., Cambridge, Mass.; E. O. Reed, Crane & Co., Dalton, Mass.; John D. Dickson, R. T. Vanderbilt Co., Norwalk, Conn.; W. P. Richardson, A. D. Little, Inc., Cambridge, Mass.; C. G. Landes, Fitchburg Paper Co., Fitchburg, Mass.; R. G. Loomis, Case Bros., Inc., Manchester, Conn.; G. A. Peterson, Rice, Barton & Fales, Worcester, Mass.; J. T. Leecock, American Writing Paper Co., Holyoke, Mass.; W. G. Trotman, West Springfield, Mass.

Boston Paper Trade Association Convenes

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., November 25, 1935—More than 100 members and guests attended the fall meeting and dinner of the Boston Paper Trade Association, held at the Exchange Club Wednesday evening. A reception and informal reunion preceded the dinner. Group singing was led by E. Lindsey Cummings.

Before the business meeting John E. A. Hussey rose to say that at the outing of the organization he had been referred to as the dean of the paper trade, but that he wished to make the honor due to John Vivian.

During the meeting, with President Frederic W. Main in the chair, the following new members were elected: Regular membership — Emmett Hay Naylor, Writing Paper Manufacturing Association, proposed by Frederic W. Main; special membership—Everett E. Ketcham, Southern Kraft Corporation, proposed by T. Charles Casey; and William S. Smock, Crown Willamette Paper Company, proposed by John E. Roach.

President Main appointed the following as a nominating committee to bring in names of members proposed as officers to be elected at the next March meeting: Col. Charles S. Proctor, John Vivian, M. L. Madden, John E. A. Hussey and Jesse G. Swift.

Mr. Main said the executive committee was working night and day in preparation for the fiftieth anniversary dinner to be held March 18.

Henry Cabot Lodge Speaks

In introducing the speaker of the evening, Henry Cabot Lodge, Jr., the president welcomed the grandson of a statesman and a scholar who is now serving his state in the Great and General Court and is House chairman of the Committee on Labor and Industries.

Mr. Lodge whose subject was "The National Outlook," expressed the thought of the supreme value of having before him such a group of men. He saw the business man as a natural leader in his community. "There are elements in this state not nearly so intelligent and so high-powered as you are. I have often wished some one would criticise the politicians. The part of government is that of a judge and an umpire. If there is anything I am convinced of it is that the power of government to do economic harm is greater than that to do good and the government beter lay off."

The speaker noted that people were beginning to see how taxes hurt. He intimated that some taxes were a "legalized larceny," quoting from President Coolidge. "We know we are one of a group of ten states who are not getting the treatment we should get."

Referring to the Interstate Compact on Labor Laws, as "another thing to help Massachusetts," he said that the President had not recognized the method for achieving national legislation in this connection. "The Interstate Compact was put into the Constitution. We have been trying to recognize these compacts between the States. We've negotiated compacts with a number of States.

"We fall for slogans and headlines. The trouble is that when men in public life utter slogans they close up. Many men of a high degree of eduction worry and elate themselves needlessly.

"Remember the slogans, 'He Kept Us Out of War,' 'Prosperity Just Around the Corner,' 'The More Abundant Life.' All those things are used, but then we have accomplished nothing. I believe that everybody is beginning to realize that integrity must be found in government."

Mr. Lodge's speech which was heartily applauded, was followed by questions, which included a discussion of the Federal Sales Tax.

Those Who Attended

Those present included: W. J. Raybold, F. W. Main, H. C. Lodge, Jr., Reuben Dunsford, Jr., F. Bendel Tracy, J. L. Hobson, H. H. Holder, T. K. Davis, K. H. Ways, W. H. Anders, E. O. Hanson, J. H. English, E. E Rice, John Kelley, E. E. Ketcham, John E. Roach, Ernest S. Reid, Arthur F. Gay, K. L. Moses, Wm. C. Ross, Horace B. Sargent, H. B. Woodward, F. D. Hatch, G. M. Graves, Walter P. Simonds, M. O. Byrne, Percy E. Weston, C. H. Dodge, H. A. Hurlbert, W. W. Binford, J. C. Campbell, E. Sussenguth, Charles I. Foster, William R. Maull, C. S. Trefrey, M. L. Simpson, N. S. Clark, L. R. Mathers, Ralph L. Day, C. Frederic Wellington, Lionel A. Walden, Herbert A. Lindenberg, Arthur M. Burr, J. Gilbert Swift, J. Nowell Whitney, L. Henry Young, Jesse G. Swift, Ernest W. Beals, Charles S. Proctor, Norman Harrower, J. R. Whitney, Hubert W. Lockhart, Harold Hinckley, L. J. Parant, A. S. Hobson, S. W. Bartlett, J. E. A. Hussey, Irving N. Esleeck, E. P. Clausmeyer, H. J. Borgue, J. G. Halloran, A. B. Helfrich, P. D. Wyman, E. P. Hay, R. M. Stone, Lewis L. Claflin, P. D. Rising, W. E. Porter, Jr, R. J. Arnold, W. Ross, John D. Zink, S. H. Orr, D. Almy Ashley, J. H. C. Fowler, Frank H. Winter, Leslie E. Flint, Frank A. Juckett, Charles A. Esty, H. C. Thayer, H. C. Upham, W. Gardner Very, Harold A. Allen, M. A. Park, Fred B. Korbel, W. N. Stetson, Jr., J. H. Brewer, Frank Cummings, E. Lindsey Cummings, A. T. Carter.

Fred Herbolzheimer, N. R. Hopkins, R. H. Welsh, C. W. Fields, W. W. Newton, J. D. Starr, Jr., Hubert L. Carter, Wm. J. McLellan, Jos. A. Moses, T. Charles Casey, E. D. Benn, P. M. Beach, Charles W. Nelson, Logan Swift and Harry W. Gardner.

Officers of the association for 1935-1936 are: President, Frederic W. Main; First Vice-President, F. Bendel Tracy; Second Vice-President, W. J. Raybold; Treasurer, T. Charles Casey, and Secretary, J. L. Hobson.

French Wood Pulp Requirements

The annual wood pulp requirements of the French paper industry have been estimated at 840,000 metric tons, according to Consul B. M. Hulley, Nantes. This total is divided as follows: Mechanical pulp 400,000 tons, unbleached sulphite 260,000 tons, bleached sulphite 90,000 tons, kraft pulp 90,000 tons. French raw materials provide for only 10 per cent of the total requirements, imported wood accounting for 19 per cent, imported wood pulp 63 per cent, and imported paper 8 per cent. French forests produce only 4 per cent of the requirements of the mechanical pulp and unbleached sulphite industries and none of the bleached sulphite. In kraft pulp the situation is somewhat better, about one-third of the consumption being manufactured from the maritime pine of the Landes region. It is pointed out that existing French resources could be used for 50 per cent of the paper production, leaving 20 per cent to be supplied by imported wood and 30 per cent by imported wood pulp. Reforestation would eventually provide all the wood required by the French paper industry.

PAPER MEN DISCUSS WASHINGTON CONFERENCE

(Continued from page 13)

ness structure only when price cutting had been thoroughly discouraged.

$40,000,000 for Improvements

A note of interest to all industry was brought up by the Kimberly-Clark executive when he said that expenditures for improvements within the industry during the past year had totaled about 40 millions of dollars, more than during the past three years but that the paper industry was still behind in its improvement program to the tune of about 100 millions of dollars. He added that "in spite of the government situation the paper industry should keep cool and put its collective head to work."

Mr. Whitney Speaks on Legislative Work

The opening address was a splendid introduction to the report of Counsel Whitney on the legislative work of the Public Affairs Committee. Mr. Whitney suggested that the work of the tariff and import committee was now more important than ever before. He concentrated on the monumental task of the legislative committee which had some 13,971 Federal bills to consider during the last session of Congress, 2000 of which were actually studied by the committee and 50 acted upon one way or another. "We maintain no lobby," declared Mr. Whitney. "But we do attempt to create a personal contact between the members of Congress and of the paper industry in order that the former may respect and appreciate the judgment of the latter."

Mr. Whitney mentioned several bills of extreme importance to the paper industry, watched carefully by the legislative committee and likely to reappear at the January session. Included were the Black-Connery bill which "might be in grave danger of passing if coupled with the bonus bill." The Federal Alcohol bill, seemingly harmless, contained provisions which might have cost the paper industry from 1½ to 2 millions of dollars if the APPA had not been on the alert. Special mention was made of the legislation proposed to make an "NRA in the forest products industry" which was a "real threat to all paper manufacturers."

A Nationwide Legislative Committee

With this preface Mr. Whitney went into his real message which was a plea for the industry to help build a present and future tower of strength in the form of a nationwide legislative committee with each paper executive a working member of that committee. He cited many instances of where direct personal contact developing into friendly and respected relationships between the industry and legislators in respective districts had been of vital help in staving off bad legislation. The provisions of the "draw back" law with respect to wrappers and containers were mentioned. Also the bill to create a Board of Trade with control over imports, exports, etc. which would have to be properly manned or very dangerous. The big demand is for personal effort on the part of individual members to make the work of the Public Affairs committee practical in accomplishment.

Mr. Whitney briefly discussed the Canadian tariff agreements recently consumated saying that "all paper products were held at the same level with the exception of a higher rate on wallboard imports. He added that some rates on exports were lowered but that, from a comparatively superficial study, he did not feel that the paper industry was much endangered by this particular arrangement."

Mr. Boyce Speaks on Reciprocal Treaties

However, both Mr. Whitney and Mr. Boyce who followed him, were strongly afraid of developments with respect to reciprocal treaties and their implications and possible effect on the industry unless the APPA gave its united support to the work of the association, legislatively and otherwise. Mr. Boyce cited experiences with reciprocal treaties with Sweden, Cuba, China, Japan and other countries and pointed out the trend, as evidenced in various cases in the U. S. Customs Court, as endangering the paper industry unless such trends were carefully watched.

All of which was in line with Mr. Whitney's earlier suggestion that the tariff and import and general legislative work of the Association was of extreme importance at the present time and merited the united support and investment of the entire industry.

Mr. Everest Speaks on Washington Invitation

Then followed Mr. Everest's analysis of the invitation to Washington and the presentation of the outcome of executive committee deliberations approved by the open meeting and to be made public at the conference itself on December 9.

The afternoon session was concluded with a short discussion of the effective work of the grading committee.

Government Paper Bids

WASHINGTON, D. C., November 27, 1935—The Government Printing Office has received the following bids for 143,500 pounds (1,000,000 sheets) of white sulphite bond paper at 6.06 cents per pound; American Writing Paper Company, W. L. Jones, Inc., George W. Millar & Co., John F. Post, Cauthorne Paper Company, Bulkley-Dunton & Co., Reese & Reese, Inc., Whitaker Paper Company, L. Hyman & Sons, Old Dominion Paper Company, Aetna Paper Company, Stanford Paper Company, Barton, Duer & Koch Paper Company, R. P. Andrews Paper Company, J. W. Butler Paper Company, Paper Corporation of the United States and J. R. Howarth Paper Company.

The same firms also bid at 6.54 cents per pound for 10,000 pounds (100,000 sheets) of white sulphite ledger paper.

The following bids were received at 5.57 cents per pound for 65,200 pounds (800,000 sheets) of white sulphite writing paper; Paper Corporation of the United States, Cauthorne Paper Company, R. P. Andrews Paper Company, Whitaker Paper Company, Bermingham & Prosser Paper Company, John F. Post, Enterprise Paper Company, Reese & Reese, Inc., J. R. Howarth Paper Company, Old Dominion Paper Company, Virginia Paper Company, Aetna Paper Company, Barton, Duer & Koch Paper Company, J. W. Butler Paper Company, and Mathers-Lamm Paper Company.

The same firms also bid 6.54 cents per pound for 57,400 pounds (400,000 sheets) of yellow sulphite writing paper.

Plan More Power for Holyoke Paper Mills

HOLYOKE, Mass., November 26, 1935—The engineering department of the Holyoke Water Power Company is working on plans for a large addition to the steam generating plant of the company. It is not planned for immediate installation but it is deemed necessary for the company to plan ahead for its rapidly growing business. It will be some weeks before the detailed plans will be announced. The company supplies a large quantity of steam generated current for the paper mills and paper converters regularly.

Obituary

Fred D. Gray

HERKIMER, N. Y. November 25, 1935—Former Mayor Fred D. Gray, aged 58, died recently in Richfield Springs of heart disease.

Frederick Doxtater Gray was born in Herkimer, January 3, 1877, the son of the late Frederick D. and Mary Lewis Gray. He received his preliminary education in the Herkimer public schools and graduated later from a private school. At the age of 23 he entered the employ of the International Paper Company's Herkimer Fiber Company and for the last fifteen years up to the time of his death he had been general manager of the firm in which he had served forty years.

In connection with his work he was an inventor of no little note in the paper manufacturing world. Several patents bear his name. One of the most important of these is an apparatus perfected by himself which turns out corrugated paper in which such fragile articles as eggs and electric light bulbs are packed. This invention alone is said to have saved the International Paper Company more than $4,000,000.

While the plant here made fiber board used principally in the fabrication of shoes and processed packing for shipping breakables, it originally was built to manufacture newsprint under the guidance of the late Senator Warner Miller, who introduced the German method of digesting pulpwood for that purpose.

It was after the International Paper Company acquired the factory for which the hydraulic canal was constructed to furnish power that Mr. Gray became identified with it. Paper making was abandoned and for years fiber board was manufactured as a by-product here.

With his knowledge of the basic principles entering paper making, Mr. Gray's plant here was selected several years ago for development of wrapping for fragile articles and it was largely through his successful experimental work that the newer subsidiary of the parent organization was established as the Holtite Packing Company which he managed together with the fiber company.

Several efforts were made to move the Holtite machinery from Herkimer but Mr. Gray through a long and close contact with officials of the International Paper Company persuaded them to continue its operation here.

He was a member of the local Masonic Lodge Bethel Lodge, I. O. O. F., and the Down and Out Cub. He was also a communicant of Christ Episcopal Church.

Surviving him are his wife, the former Mabel Cristman to whom he was wed April 21, 1903; two first cousins, Lewis P. West of this village, and Mrs. Jessie Finn, Washington, and two more distant cousins, Mrs. Marion Dick, of Watertown, and Mrs. Frances Grappotte, of Cape Vincent.

U. S. Casein Widely Used

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 25, 1935.—The United States is rapidly attaining self-sufficiency with regard to casein, a by-product of dairying which is used widely in industry, and particularly in the manufacture of certain grades of paper, according to C. C. Concannon, Chief of the Commerce Department's Chemical Division.

In 1920 two-thirds of the casein required in American industry was obtained from foreign countries, and as late as 1929 approximately one-half was imported, statistics show. By 1934, however, only 4 per cent of the casein required in the United States was imported, the balance being supplied by domestic producers, according to Mr. Concannon.

Domestic production of casein during 1934 reached the high total of 37,331,000 pounds, according to statistics gathered by the Bureau of Agricultural Economics, Department of Agriculture. This compares with 24,000,000 pounds in 1933, 21,000,000 in 1924, and around 7,000,000 pounds in 1922.

Casein imports amounted to only 1,500,000 pounds during 1934 compared with 27,580,000 in 1929 and an average of about 22,500,000 pounds per annum during the seven years following 1922. Imports since the beginning of 1935, have increased slightly, totalling 1,250,000 during the first eight months of the year compared with a little over 1,000,000 pounds for the corresponding period of the preceding year, it was stated.

The large bulk of casein imported into the United States comes from Argentina, statistics show. Smaller quantities are obtained from France, Germany, Belgium, United Kingdom, Canada, British India, New Zealand, and elsewhere.

United States domestic production in 1934 was distributed as follows: Wisconsin, 11,876,000 pounds; California, 11,012,000; Vermont, 4,159,000; New York, 3,992,000; Illinois, 2,446,000; and Idaho, 1,501,000 pounds, the small balance being distributed among a number of widely scattered states.

Japanese Paper Production

WASHINGTON, D. C., November 25, 1935—Production of foreign style paper in Japan during August amounted to 73,535 short tons and sales to 65,360 tons, according to figures compiled by the Japan Paper Manufacturers' Association. In comparison with the preceding month there was an increase of 1,534 tons in production but a decline of 1,035 tons in sales. In comparison with the corresponding month in 1934, production increased about 5 per cent and sales declined 4 per cent. This is the second consecutive month this year that production has been substantially above sales, indicating an increase in stocks and making probable a further increase in restrictions on output. Imports of paper and paper products during August amounted to 7,198 tons, an increase of 356 tons over the preceding month. Printing paper accounted for 5,996 tons of this total. Canada supplied over 95 per cent of the printing paper imports, receipts from the United States being negligible. Exports of paper and paper products from Japan during August totaled 7,981 tons, a decline of 1,087 tons compared with July.

Tayloe Co. Buys Martins-Currie Stock

MEMPHIS, Tenn., November 25, 1935.—The Martins-Currie Paper Company, of Jackson, Tenn., organized ten years ago has surrendered its charter and is liquidating its business. A. H. Martins is the liquidating agent. The company's stock of merchandise has been sold to the Tayloe Paper Company, Memphis, Tenn. The house will be continued by the Tayloe Paper Company, using the name of Martins-Currie Paper Company as a trade style. Both Messrs. Martins and Currie will be connected with the organization. Mr. Martins will be the manager.

The Tayloe Paper Company, Memphis, announces also that its Jackson, Miss. house will in the future be known as the Townsend Paper Company, which name will be used as a trade style. Sherrod Townsend is manager of the Jackson, Miss. house.

A representative stock of fine and coarse papers will be carried at both branches.

Superintendents Meet at Kalamazoo

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., November 25, 1935—The regular monthly meeting of the Michigan Division of the Superintendents' Association was held at the Park-American Hotel on Thursday evening, November 21, at 7:30 P. M. This was the first meeting under the new officers' supervision, with a large crowd present. Following dinner, Chairman Otto F. Fischer called the meeting to order and made some well chosen remarks to the members and guests and outlined some of the plans for future meetings and mentioned in particular the joint meeting with the TAPPI in January.

Robert Eminger, national secretary of the association, was an honored guest and the speaker was Fred M. Gage, president of the Gage Printing Company, Battle Creek, Mich. The talk given by Mr. Gage was most interesting and in as he has spent 54 consecutive years in the printing business, his mastery of the subject was indeed complete. He gave a detailed account of the early problems of the industry and explained by stages the development of progress made by modern machinery and processes, and at the same time outlining the improved methods and perfection in the paper industry all blending together, making an address which would interest and instruct the layman as well as the expert. Briefly mentioning some of the suggestions and subjects, were a closer cooperation between the printer and the paper maker, indicating on paper packages shipped by the mill as to which way the grain runs and more care in packaging paper to eliminate damage en route, more legible stenciling of contents of package. The subject of moisture control in paper and the difficulties encountered by the printer, with static electricity, was another part of the talk and the future necessity of air conditioning in printing plants, press room, bindery room and stock room were stressed. Another suggestion was that of the feasibility of wrapping paper in cases or containers with moisture proof paper, and when possible marking the moisture content of the paper. At the close of Mr. Gage's talk, a rising vote of thanks was given him and the open forum which followed was most instructive. Some of the experiences related by the different supers were amusing indeed.

Discussions pertaining to National Convention matters followed, after which adjournment was declared.

SKF SA Type Pillow Block

The SA Type Pillow Block, a new addition to the long line of SKF transmission appliances, is introduced by SKF Industries, Inc., Philadelphia, with an eight-page booklet.

Used in conjunction with this unit is the SKF Spherical Roller Bearing which has established performance records in railroad journals, on roll-necks, crusher shafts and on vital rotating parts of other heavy duty equipment.

The SA Type Pillow Block has a split construction that provides for the least number of parts, and, with the SKF Spherical Roller Bearing, is the outstanding unit having the inherent ability of rolling self-alignment without imposing extraneous loads due to setup inaccuracies or shaft deflections. It is designed with cross and transverse ribbing which assures the most strength at the least weight and minimizes warping. Felt sealing rings shield the bearings against dirt and other injurious matter. When dirt conditions are extremely severe, flingers can be used.

To install, the lower half of the SA Type Pillow Block is set in place and bolted, the bearing mounted on the shaft and properly located. The upper half is then bolted on.

Union Bag & Paper Report

The report of Union Bag and Paper Corporation for 12 months ended September 30, 1935, subject to year-end adjustments and annual audit, shows net profit of $113,257 after depreciation, federal taxes, etc., equal to 77 cents a share on 146,074 no-par shares of capital stock, exclusive of treasury shares, and excluding 50,000 shares issued during August. Based on 196,074 shares outstanding at close of the period net profit is equal to 58 cents a share.

This compares with net profit in 12 months ended September 30, 1934, of $909,164, equal to $6.23 a share on 145,962 shares then outstanding.

Alexander Calder, president, says: "This statement reflects the small profits made during the nine months ended June 30, 1935. The loss of volume, and low prices which prevailed during the greater part of this nine months period, were discussed in our letter of September 9, 1935, to our stockholders. The major portion of the profits for the twelve months period ended September 30, 1935, is attributable to the last three months of the period. While this period is not as good as the three months period ended September 30, 1934, conditions are continuing to improve, both as to volume and prices."

Income account for 12 months ended September 30, 1935, compares as follows:

	1935	1934
Sales	$9,703,466	$8,609,434
Costs, exp. and depr.	9,577,301	7,555,814
Operating profit	$126,165	$1,053,620
Other income	25,574	28,956
Total income	$151,739	$1,082,576
Loss controlled Co., etc.	19,623	13,412
Federal taxes, etc.	18,859	160,000
Net profit	$113,257	$909,164

Standard for Fiber Insulating Board

The National Bureau of Standards, Department of Commerce, has announced that the second edition of the Commercial Standard for Fiber Insulating Board, CS42-35, is now available in printed form. This reprensents reaffirmation of Commercial Standard CS42-32 with an amendment which permits drying the board to constant weight at 160°F, instead of 220°F as formerly required. However, the Bureau points out that the lower temperature is to be used only with boards which are injured by the higher temperature. So far as all other methods of test and other requirements are concerned, the reaffirmed standard follows the original specification as developed by a group of manufacturers who were desirous of establishing a nationally recognized quality standard for the guidance of the architect, builder and prospective home owner, and which became effective September 15, 1935.

The commercial standard is a minimum specification embodying the important characterists of a satisfactory insulating board, chief among which is maximum thermal conductivity set at 0.36 Btu per hour per square foot, per deg. F, per inch thickness. Since this class of board is used structurally as well as for its insulating value, strength is an important characteristic and therefore tensile and deflection requirements, and maximum water absorption are included in the commercial standard.

The thermal conductivity tests are based on Part II, Conductivity of Homogeneous Materials, of the Standard Test Code for Heat Transmission Through Walls as adopted by the American Society of Heating and Ventilating Engineers.

Reaffirmation with amendment was announced June 24, 1935.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Albany, New York—A. P. W. Paper Company has started construction work in connection with a sizable alteration program which involves consolidation of its Broadway and Liberty Mills. Contracts thus far let are: Masonry and general construction, J. P. Sewell, Albany, N. Y.; steelwork, James McKinney & Son, Albany; sprinklers, Rockwood Sprinkler Company, Worcester, Mass.; plumbing, heating and ventilating, A. J. Eckert Company, Albany; electrical, Fischback & Moore, Inc., New York. Plans are also being prepared to cover a sizable new finished goods storage building approximately 172 x 300 feet, steel frame, concrete slab, brick walls. Johnson & Wierk, Inc., of New York are engineers and construction managers handling the alteration work and are also preparing plans and specifications for the new building.

Valdosta, Ga.—The Chamber of Commerce has negotiations under way for the construction of a local pulp and paper mill, to utilize Georgia slash pine as raw material. Company name is temporarily withheld. Proposed mill will be of large capacity, with reported investment in excess of $350,000, including buildings and equipment.

Watervliet, N. Y.—The Behr-Manning Corporation, Troy, N. Y., manufacturers of abrasive papers and kindred abrasive products, is awarding miscellaneous contracts for new addition to plant at Tenth avenue and Twenty-seventh street, Watervliet, recently referred to in these columns. Award for masonry has been let to J. J. Judge & Sons, 65 Fourth avenue, Troy, who will begin superstructure at once. New unit will be three-story, 50 x 200 feet and 50 x 100 feet, and is estimated to cost close to $125,000, with equipment. General contract recently was awarded to the Morton C. Tuttle Company, 31 St. James avenue, Boston, Mass.

Burnside, Conn.—The Taylor-Atkins Paper Mills, Inc., has recently been chartered with capital of $60,000 and 1,000 shares of common stock, no par value, by officials of the Taylor-Atkins Paper Company, 200 Fifth avenue, New York, N. Y., which formerly operated a local paper mill at Burnside. It is understood that the new organization will resume mill operations at this location at early date.

Aberdeen, Wash.—City Council at Aberdeen, in cooperation with Herbert Horrocks, mayor, has negotiations under way with a company, name temporarily withheld, for the construction of a new pulp mill on site at Junction City, a suburb, which it is proposed to annex to Aberdeen for purpose of furnishing water to new plant. Project will include construction of several mill units, to be equipped for large capacity.

Shawinigan Falls, Que.—Canadian Industries, Ltd., 1050 Beaver Hall Hill, Montreal, Que., has preliminary plans under way for new addition to mill at Shawinigan Falls, used for production of cellophane stocks. It will be one-story, estimated to cost close to $100,000, including machinery. Proposed to ask bids on general contract early next spring.

Cincinnati, Ohio—The Jackson Box Company, 4927 Beech street, Norwood, manufacturer of corrugated fiber boxes and containers, has approved plans for new addition to plant, one and two-story, 100 x 100 feet, including improvements in present factory. General contract has been awarded to the Austin Company, Euclid avenue, Cleveland, Ohio, and work will be placed under way at once. Cost close to $40,000, including equipment.

Neenah, Wis.—The Sawyer Paper Company has taken out a permit for new addition to plant, to be used for storage and distributing service. It will be one-story, 32 x 36 feet. No estimate of cost has been announced. Work will be placed under way at once.

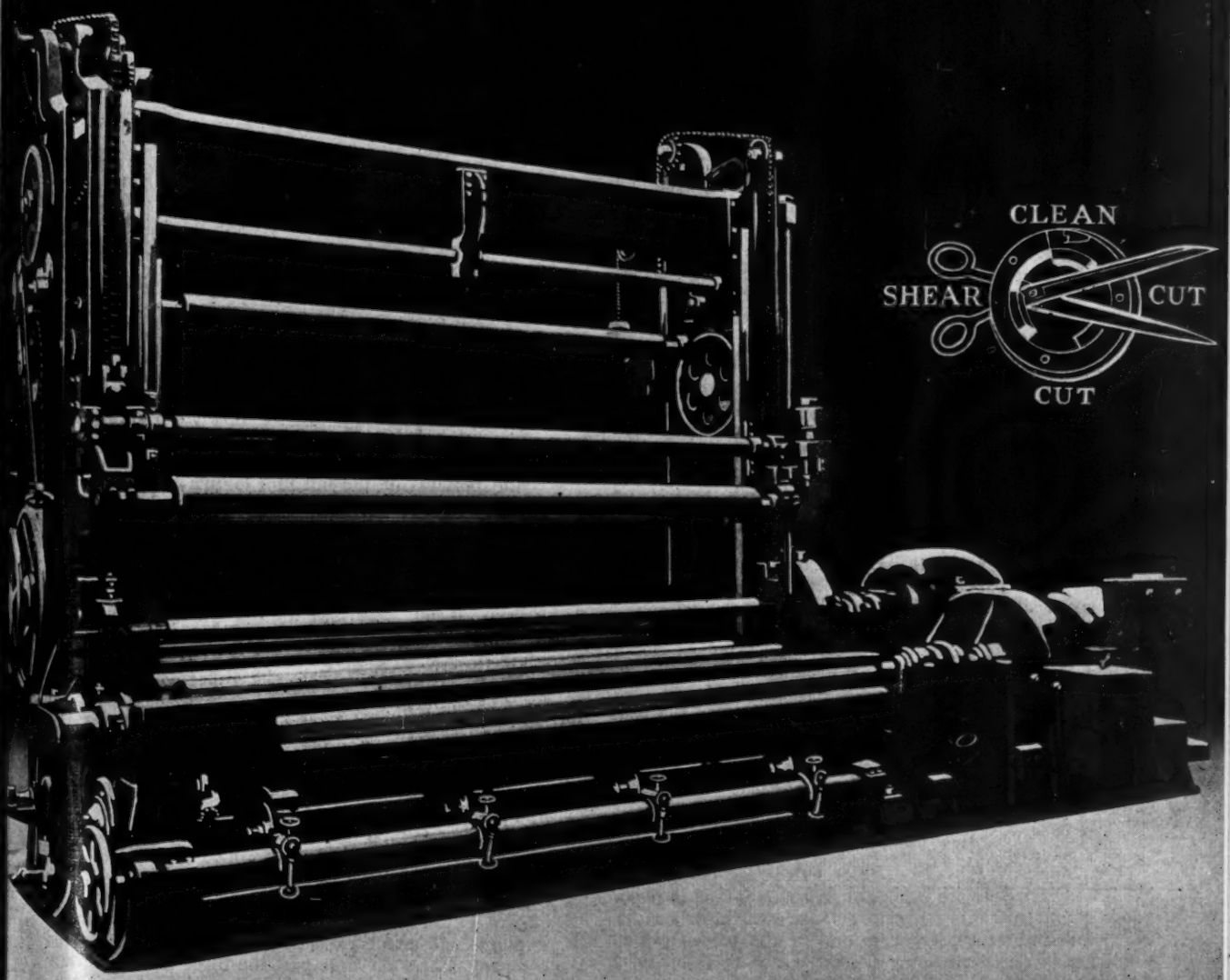
Hinsdale, N. H.—The Hinsdale Paper Manufacturing Company, manufacturer of crepe tissue and kindred paper stocks, plans rebuilding of portion of mill, recently destroyed by fire. Loss reported over $200,000, including equipment. Louis N. Stearns is treasurer and general manager.

Lynchburg, Va.—The Jno. H. Heald Company, manufacturer of laminated board, liner board and kindred products, has filed plans for new one-story addition to mill, for which superstructure will begin at early date. It is understood that new unit will be equipped primarily for special processing of waste paper, output to be used at the mill. It is reported to cost over $45,000, including equipment.

Martinsville, Va.—The Fibre Board Container Company, 3200 Williamsburg avenue, Richmond, Va., manufacturer of corrugated fiber boxes and containers, solid fiber shipping cases, etc., has awarded general contract to James Fox & Sons, 2501 East Franklin street, Richmond, for proposed new plant at Martinsville, where site was recently acquired, as previously noted in these columns. It will be one-story, 80 x 250 feet, equipped primarily for production of large corrugated containers for furniture and similar products. Initial plant will give employment to about 50 persons and is estimated to cost about $75,000, including machinery. Work will be placed under way at once. It is proposed to have unit in service early next year. David A. Donati is president.

Marrero, La.—The Celotex Corporation, 919 North Michigan avenue, Chicago, Ill., recently chartered under Delaware laws to succeed to the Celotex Company, manufacturer of insulating and building board products, has taken over mill of the latter organization at Marrero, near New Orleans, and will develop increased operations at early date, giving employment to full working quota

WINDERS AND REWINDERS



SAMUEL M. LANGSTON COMPANY

CAMDEN, NEW JERSEY

under capacity schedule. New company is capitalized at $3,000,000 and 500,000 shares common stock, no par value. B. G. Dahlberg, head of former company, is president of new organization.

Cleveland, Ohio—The Hankins Container Company, 3044 West 106th street, manufacturer of corrugated paper boxes, containers, etc., has taken out a permit for erection of new addition to plant, recently referred to in these columns, and is breaking ground for unit. It will be two-story and basement, 54 x 102 feet, to be used for general operating and office service, and is estimated to cost about $60,000. Gillmore-Carmichael-Olson Company, 1873 East Fifty-fifth street, Cleveland, is general contractor. Warner & Mitchell, Buckley Building, are architects.

Mankato, Minn.—The Northwestern Hemp Company, National Citizens' Bank Building, has begun construction of new one-story plant on local site for the manufacture of cellulose products. It will be about 40 x 50 feet, equipped with special machinery for line of output noted. F. E. Horton is president.

Houston, Tex.—Clarke & Courts, Inc., 2402 C street, Galveston, Tex., wholesale paper goods, has awarded general contract to the Southwestern Construction Company, 3802 Calhoun street, Houston, for new local plant at 1210 West Clay street, to be used for storage, distributing and converting service. It will be one-story, 180 x 220 feet, estimated to cost about $75,000, with equipment. New unit will be thoroughly modern, with installation to include an air-conditioning system. On completion, scheduled for early date, company will remove headquarters from Galveston to new location. Joseph Finger, Inc., National Standard Bank Building, Houston, is architect.

Toronto, Ont.—The Maxwell Paper Box Company, recently organized to manufacture paper boxes and containers, has begun operations in leased space in the Slazenger Building, totaling about 4000 square feet of floor area, and will develop sizable production. A specialty will be made of set-up box units.

Toronto, Ont.—Canada Foils, Ltd., 7 Fraser avenue, manufacturer of paper foil products, has approved plans for new addition to plant and will proceed with superstructure at once. It will be one-story, used for storage and distribution, estimated to cost about $25,000, with equipment. New unit will release space heretofore used for similar service, providing increased production facilities.

Hobart, Tasmania—The Derwent Valley Paper Company, Ltd., Sydney, Australia, and Hobart, will locate its proposed new paper mill, lately referred to in these columns, on site near Hobart, and is said to be arranging early call for bids on general contract for initial units. The plant is being designed for annual output of about 160,000 tons of pulp and paper products and will comprise a group of buildings for a complete self-contained unit, including power house, machine shop and other mechanical structures. It is reported to cost close to $5,000,000, with machinery, considerable of which is to be purchased in the United States. It is proposed to begin actual work on project early next year.

New Companies, Etc.

New York, N. Y.—The Fiber Cord Company, Inc., has been chartered with capital of $10,000, to deal in paper goods of various kinds, fiber products, etc. Morris Katz, 627 East Eighteenth street, is one of the incorporators. Company is represented by Kosseff, Levy & Rothman, 2 Lafayette street, New York, attorneys.

New York, N. Y.—Bowater Paper Company, 18 East 48th street, has filed notice of change in capital stock to 200 shares of stock, no par value.

Milwaukee, Wis.—The Wisconsin Fiber Company has been organized to manufacture and deal in fiber products. Earl M. Wanecek, Milwaukee, is principal incorporator. Company is represented by E. C. Pommerering, 161 West Wisconsin avenue, Milwaukee, attorney.

Indianapolis, Ind.—The Security Bag Company, Lockland, Cincinnati, Ohio, manufacturer of paper bags, boxes, containers, etc., an Ohio corporation, has filed notice of organization to operate in Indiana, covering manufacture and distribution.

Fall River, Mass.—The Fall River Paper and Supply Corporation has been incorporated with capital of 200 shares of stock, no par value, to deal in paper goods of various kinds. Morris Horvitz, 96 Fourteenth street, is president and treasurer.

Boston, Mass.—Peerless Products, Inc., has been organized with capital of 5,000 shares of stock, no par value, to deal in tissue papers and allied products. Roland W. Boyden is president, and George Loveland, 71 Mount Vernon street, Boston, treasurer and representative.

Jersey City, N. J.—Processed Papers Manufacturing Company has been incorporated under direction of the Corporation Trust Company, 15 Exchange place, with capital of 1,000 shares of stock, no par value, to manufacture paper goods of various kinds.

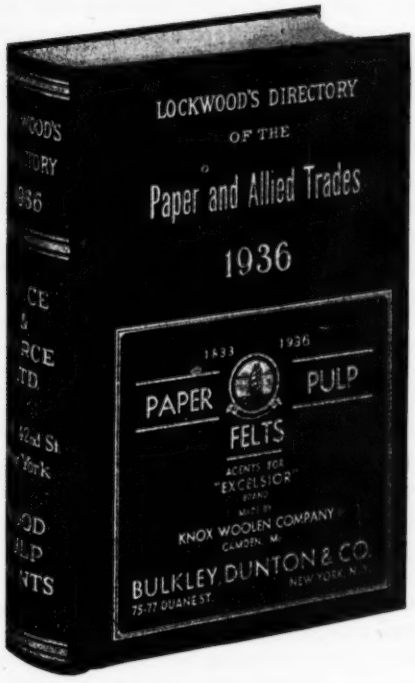
I. P. Demolishes Mills Near Brownville

BROWNVILLE, N. Y., November 25, 1935—The task of demolishing idle mills of the International Paper Company in this section is progressing rapidly and contractors expect to have the sites cleared by spring. Mills here and also in the neighboring town of Pamelia are being razed, while the vacant property of the old Continental Bag and Paper Company at Watertown is also to be demolished. Some of the plants have been landmarks hereabouts for half a century and all were once the scene of great activity. Operations in these mills were suspended during the strike of 1915 and the machinery has not been operated since. A large force of men are tearing down the three mills near this village, and the huge rafters and brick walls have been demolished, while in the town of Pamelia only a skeleton remains of the old mill known as No. 4. The old Remington mill named after the late Charles R. Remington, for years a prominent figure in the paper industry, is also being razed and only a few walls and window castings remain.

For some time the crew of workers have been tearing down the roof and towers of the old Ontario mill in this village but the huge plant will require considerable work before it is leveled. Contractors expect to have this job completed before the arrival of cold winter weather. Work on the old Continental Bag and Paper plant has also been started but the actual work of razing the structure is not expected to start before spring. Plans call for the removal of water-wheels before the winter.

It is said that the plants are being demolished in order to eliminate yearly tax payments. All structures have been vacant for many years. Assessments show that the Continental Bag and Paper property is valued at $72,000 while the Ontario mill in 1913 was listed at $132,500. At that time the Remington mill was assessed for $159,500 and Mill No. 4 for $100,000. It is understood that the removal of all plants will effect a considerable saving in taxes for the company. For some time past the three mills near this village have been listed under the name of Systems Property Company, Inc.

The 1936 Edition Contains



40 Page list containing 2400 names of Mill Officials

190 Pages of Mill Data Complete on 760 Mills

100 Page list containing information on products made by the paper mills

150 Page list of Paper Specialties and where obtainable

10 Page list of Glazed and Coated Paper and Board Manufacturers with outline of their equipment

50 Page list of Paper Merchants

20 Page list of Rags and Paper Stock Dealers

40 Pages of data on Rags and Paper Stock Consumed by the Mills

30 Page list of Box Manufacturers

5 Page list of Bag Manufacturers

10 Page list of Envelope Manufacturers

10 Page list of Tablet and Tag Manufacturers

2 Page list of Papeterie Manufacturers

2 Page list of Wall Paper Printers

10 Page list of Mill Supply Houses

List of Pulp Testing Chemists

240 Pages of Watermarks and Brands

25 Page list of Trade Associations and Their Headquarters

200 Pages listing Materials and Equipment used in making paper and pulp

35 Pages giving addresses of Manufacturers of Materials and Equipment for Making Paper

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THE CHICAGO MEETING

The first open meeting of the American Paper and Pulp Association held in Chicago in a long number of years was a splendid success both from the standpoint of attendance and from the interest manifested in various matters of vital concern to the industry that were considered. Prominent among these was the forthcoming conference in Washington on December 9, called by Major George L. Berry, who has recently been appointed co-ordinator for industrial co-operation, to attend a round table conference, "for consideration of the best means of accelerating industrial recovery, eliminating unemployment and maintaining business and labor standards." As a result of the Chicago meeting the association will take part in this conference, but with reservations. The character of these reservations will not be disclosed until the conference, but some hint of the feeling of the members may be gained from a statement by Mr. Frank J. Sensenbrenner, the president of the association, in his general remarks "we should put our shoulders to the wheel and iron out our own troubles."

In speaking on the reciprocal trade agreement between the United States and Canada which was recently concluded, Mr. Sensenbrenner said that industry was today facing some of the most serious problems in the memory of any living manufacturer. "Not the least of these problems," he said, "is that of the effect of the reciprocal trade agreements, some of which are already in effect and others of which are expected to be consummated soon."

"The Swedish Trade Agreement reduced the rate on wrapping paper 5 per cent with the result that imports in August, the first month in which the Agreement was in effect, were equal to one quarter of those for the entire year of 1934, and at a delivered price below that at any American mill.

"Even more serious, however, is the indirect effect of the Cuban Reciprocal Trade Agreement, under which that Republic was granted heavy reductions on various specific commodities, and a preferential rate on all its other products 20 per cent below that fixed in the existing tariff act or in any trade agreement. Importers of various commodities are claiming in a series of cases before the United States Customs Courts that products of all other nations are entitled to the concessions granted imports from Cuba. This would involve a flat reduction, if the importers claims are successful, of 20 per cent in practically the entire existing tariff schedule, and of a greater percentage on the commodities on which Cuba is given a specific preference. I am informed that there are now pending in the Customs Courts some 2,000 separate such cases, and the paper manufacturers are contesting this claim in all the cases involving imports of paper. Such cases include shipments from Japan, China, Scandinavia, and many other European countries.

"It is significant that, though it was claimed that the Reciprocal Trade Agreement Act was devised as a means of increasing exports of farm products, the plaintiff in a test case now pending before the United States Customs Court at New York construes this Act as decreasing the protection previously granted against corn from Argentina. If this case is won by the importers, corn from any part of the world must be admitted at half the rate originally fixed by Congress.

"Under the Cuba Trade Agreement, the duty rate on corn from that Republic was cut to 10 cents per bushel, as compared with the general tariff rate of 25 cents per bushel; in other words, Cuba was granted a 50 per cent reduction on the general rate of 25 cents, and a further 20 per cent preferential reduction from this reduced rate. The importer of the Argentine corn, while conceding in this case the validity of the 20 per cent preferential, claims that the additional reduction by the phrasing of the Cuban Agreement is not exclusive to Cuba but applies to all other nations. This would mean that the Argentine corn would come into this country at a duty rate of 12½ cents per bushel, through Congress, in the interest of American farmers fixed the original rate at 25 cents. Congress, however, granted the Administration the right to negotiate reciprocal trade agreements for the reduction of tariff rates, and the Argentine corn case is only typical of 2,000 other cases.

"Other similar claims are made by importers of cheese, meat products, leather, flour, vegetables, raw and prepared, tomatoes, potatoes, onions, lentils, beans and a wide variety of fruits, to say nothing of products of the fisheries, forests and factories."

It cannot be disputed, as Mr. Sensenbrenner intimated, that perhaps never in its history has the pulp and paper industry been faced with so many problems of great and vital concern as at the present time. Obviously these problems can be best met by organized effort. The Chicago meeting is another sign that the American Paper and Pulp Association is attacking these problems intelligently and efficiently and may be depended upon to protect the interests of the industry under whatever circumstances may arise. The industry is to be congratulated on the fact that its main association is operating so effectively at this particular time.

TO OPPOSE PRODUCTION RESTRICTIONS

Opposing production restrictions, either in industry or agriculture, as obstructions to recovery, and recommending vigorous opposition to any new attempt by the Federal Government to regulate industrial wages and hours, the report of the Committee on Relation of Government to Industry was made public last week by the National Association of Manufacturers.

It is now being submitted to the member manufacturers throughout the country in every industry and to affiliated state, local and trade organizations of manufacturers for review prior to consideration and adoption as the formal viewpoint of industry at the annual Congress of American Industry to be held December 4 and 5 at the Commodore Hotel, New York, in conjunction with the convention of the National Association of Manufacturers.

"We join in the demand made by every enlightened economic organization for abandonment of the philosophy that prosperity can be produced through curtailing production, whether in agriculture or industry," the report of the Committee said. "The true abundant life can be supported only by abundant production of the things that enrich the lives of all."

Pointing out that "we may now appraise our situation and take counsel for the future upon the basis of sound principle without the necessity of compromising or adopting expedients under the stress of emergency conditions," the committee emphasized its opposition to any economy of scarcity, asserting that "the cheaper a product can be produced, the cheaper it can be sold; the lower the selling prices, the larger the number of people who will buy and use it.

"The progressive relationship between low costs and low prices, increased consumption and increased production, and the certainty of its leading to increased employment and increased use of raw materials, is so simple and clear that it should have been entirely obvious to those who are directing the destinies of the Nation," the Committee said. "Instead, however, the Administration in many cases, has chosen the opposite course and by advocating policies, some of which have been enacted into law, that restrict production and increase costs has perpetrated the evils of unemployment.

"These restrictive policies and laws, together with the creation of any unstable financial outlook growing out of a rising national debt and an unbalanced budget, have given rise to three grave fears: the fear of inflation, the fear of new hostile legislation, and the fear of a change in our form of government already envisioned by spokesmen of the Administration."

On the subject of Federal legislation to supplant the illegalized NIRA, the Committee said:

"Federal control of hours of labor must inevitably lead to the arbitrary, compulsory, and progressive shortening of the work week, coupled with an endeavor to preserve the weekly income of the wage-earner. The control over hours generally forces up prices and wage rates but not actual wages, and the accompanying endeavor to prevent a reduction in real wages is, in the long run, impossible of attainment and harmful to all concerned.

"We therefore recommend that the association should oppose any proposals for Federal legislation to take general control of wages and hours of labor."

Production Ratio Report

The following statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

1935	Total Production Ratio	1934	Total Production Ratio
January	65.8%	January	.....
February	70.0%	February	.....
March	70.5%	March	.....
April	70.0%	April	.....
May	69.4%	May	.....
June	72.3%	June	.....
July (b)	67.8%	July	.....
August	70.9%	August	.....
September (c)	75.0%	September (c)	59.4%
October	75.6%	October	64.7%
November	.....	November	61.7%
December	.....	December (a)	62.1%

COMPARATIVE WEEKLY SUMMARIES

CURRENT WEEKS, 1935		CORRESPONDING WEEKS, 1934	
*November 9	75.7%	November 10	62.1%
*November 16	72.5%	November 17	61.6%

The following statistics show the number of mills reporting by ratio groups:

Ratio Limits	Number of Mills Reporting, Current Weeks: November 9, 1935	November 16, 1935
0% to 50%	87	73
51% to 100%	240	185
Total Mills Reporting	327	258

* Subject to revision until all reports are received.
These data exclude (a)—Christmas Day, (b)—Fourth of July, (c)—Labor Day.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours," were as follows:

1934	1935	1935	1935
September 62%	January .. 61%	May 61%	September. 69%
October 63%	February . 67%	June 65%	October .. 76%
November 56%	March ... 67%	July 59%	
December 53% (a)	April 61%	August ... 65%	

Week ending November 9, 1935..... 75%
Week ending November 16, 1935..... 69%

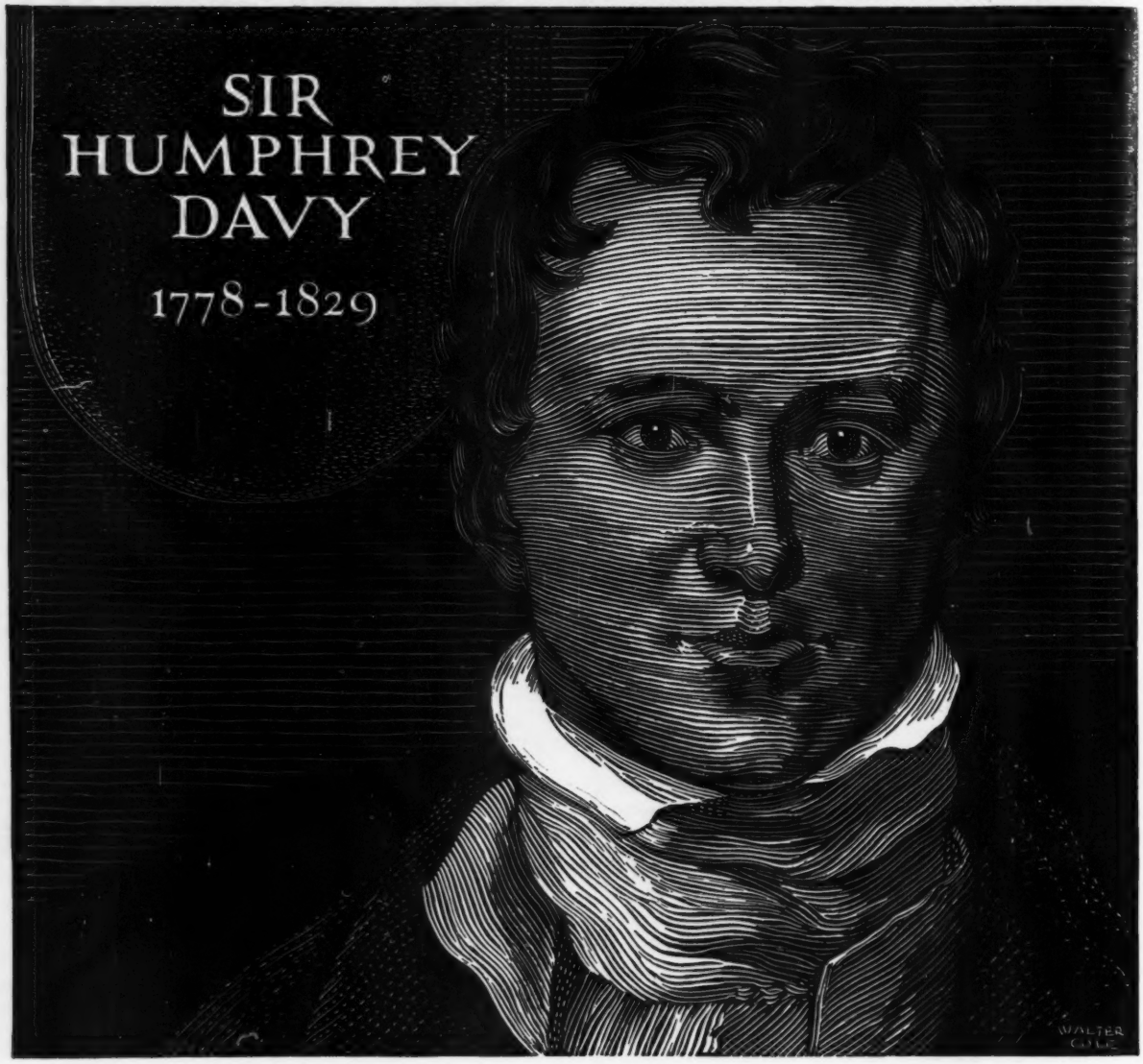
Hinsdale Paper Mfg. Co. To Rebuild

HINSDALE, N. H. November 25, 1935.—The owners of the Hinsdale Paper Manufacturing Company, which was recently burned, have stated that it has been decided to rebuild the plant from the ground up. Work of razing the walls and remaining interior parts of the building will be started immediately and as soon as this is done and the insurance adjusted work of rebuilding will begin. Definite figures as to the loss are still unavailable pending the insurance inspection. The new building will be similar to the old, except that more modern equipment will be included wherever possible. The new structure will be flush with the walls of the companion buildings on either side.

Rushmore Mills Speed Up Operations

GOUVERNEUR, N. Y. November 25, 1935—Mill officials of the Rushmore Paper Mills report that operations are progressing satisfactory and last week the new storage and finishing annex was opened. Only a small force is being employed in the new addition but plans are under way for taking on more help as production in the main mill expands. It was indicated that the paper machine in the plant is turning out a satisfactory grade of paper and that production would be speeded up gradually. The property was acquired last spring from the Oswegatchie Paper Company and has undergone considerable repairs.

NUMBER THREE OF A SERIES OF FAMOUS PIONEERS IN CHEMICAL HISTORY



Apprenticed to a surgeon and apothecary at the age of fifteen, Davy was appointed to the Royal Institution in 1801 at the age of twenty-three and was knighted eleven years later. His health failed, however, while he was still at the height of his career and he died in 1829 at 51. Davy is said to have been one of the first to use the electric current for thorough and fundamental chemical investigation.

IN 1807 fashionable London paid twenty pounds a head to watch Sir Humphrey Davy at the Royal Institution perform the miracle of the age—to see him produce small quantities of metallic sodium by means of a new-fangled electrical apparatus. Davy's epoch-making discovery and his pioneer work with Faraday in experimental electricity marked the beginning of the modern electrolytic process for manufacturing caustic soda. Mathieson, pioneer producer of high purity caustic soda both by the electrolytic and ammonia-soda processes, has also pioneered the distribution of caustic soda in liquid form to large consumers. Mathieson Caustic Soda is now supplied to industry from three strategically-located producing points — Saltville, Va., Niagara Falls, N. Y. and Lake Charles, La.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

The Nature of Cellulose*

A Historical Review

By E. Heuser[1]

(Continued from the issue of November 21, 1935)

Chapter II. The Fine Structure of Cellulose as Revealed by X-Ray Investigation

The epoch of cellulose chemistry which we have just been reviewing began after a long period of rather slow development, in the year 1920, with an almost sudden abundance of experimental facts and speculative activity, and it is to be regarded as a significant coincidence that the application of Roentgen rays—X-rays—as a tool of looking behind the curtain which, to the unaided eye, veils the fine structure of the high molecular substances and textile fibers, rendered its first essential results about the same time. It was the end of a period, during which the floor had been prepared by *Ambronn's (1)* investigation on the double refraction of textile fiber (1911), the results of which revived *von Naegeli's (2)* more than 50 years' old conception of the crystalline nature of plant membranes and colloids in general. This was followed by *von Laue's (3)* prediction and soon established recognition that a crystal behaves as a three-dimensional diffraction grating to X-radiation which indicated regularity of interatomic distances and hence of internal structure (1912). But 6 years passed before *Scherrer (5)* applied the method developed by himself and *Debye (4)* in Göttingen for the X-ray analysis of colloids, to cellulose and starch. It was *Ambronn (6)* again who, one year earlier (1917), expressed the opinion that cellulose having shown its crystalline structure through double refraction (geometrical anisotropy) should, when exposed to monochromatic X-radiation, render a spectrum as characteristic for crystalline substances. Ambronn, according to his own words was not in a position to make the experiment, but he supplied the Ramie fiber preparation from which Scherrer's first fiber diagram of fame resulted. At the same time (1917) *Hull, (7)* independently of Scherrer, had obtained the first X-ray diagrams of cellulose fibers.

With the Debye-Scherrer or Hull method any colloid may be investigated as an amorphous powder, pressed into the form of a small rod and surrounded by a film on which the effect of X-radiation is then fixed. The diagram of the Ramie fiber, thus produced by Scherrer, revealed a similar regularity of internal structure to that observed on macro-crystals. von Naegeli's conception as well as Ambronn's findings on the crystalline nature of cellulose appeared to be confirmed. This method applied to the analysis of substances of macro- and micro-crystalline nature allowed to determine not only the geometrical spacing of the smallest crystals (micellae) but also the size of them. However, the evaluation of the X-ray spectrum of the Ramie fiber in these respects did not yet lead to unequivocal results.

Justice to history commands to mention here that the first X-ray diagram of textile fibers (hemp and natural silk) was published already in 1913, by two Japanese investigators, *Nashikawa and Ono, (8)* and that they interpreted the diffraction effect as being indicative of small crystals situated in a position parallel to the fiber axis. Their observation, communicated to the Physical-Mathematical Society of Japan in September 1913, remained hidden, however. It is quite possible that their observation, had it become known to the world at the time it originated, would have shortened the period of 8 years which lies between von Laue's discovery in 1912 and the beginning of systematical X-ray studies on textile fibers and particularly on cellulose in 1920.

This systematical study, extended over a period of about 10 years, was enacted by R. O. Herzog and Jancke and, interesting enough, the direct cause for it was that Scherrer in his first experiments on X-radiation on cellulose and starch had found these substances to be of amorphous structure. Judging from the double refraction Herzog thought Scherrer's statement not to be true and repeated with Jancke, Scherrer's experiments. In the meantime, Scherrer had continued his studies which then led to the diagram mentioned. (9). *Herzog and Jancke (9)* published the first monochromatic cellulose diagrams in 1920, from which they, independently, drew the same conclusion as the two Japanese investigators had done before, and the crystalline nature of cellulose appeared definitely established. To the Ramie diagram were added those of cotton, woodpulp, and many other fibers. They all rendered the same diagram, and evaluation led to the conclusion that cellulose, no matter from which source it originates, is chemically the same substance, a hypothesis which some years before had been drawn from chemical evidence, *(10)* but which scarcely could be derived from X-ray evidence and which shows that the possibilities of

* Paper prepared for and partly read before the American Chemical Society (Cellulose Division) Tricentenary meeting in New York, April, 1935.

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this method were overrated in the earlier years of its application.

The vivid activity in the field of X-ray investigation of that time brought about rapid developments in the technique, one of the first of which was the reduction of β-radiation and which also resulted in greater exactness of interpretation. *Polanyi* (1921) first alone, *(11)* later together with *Weissenberg, (12)* applied the crystal-in-rotation method, which enabled them to obtain a perfect record of all possible diffractions around the axis of the crystal lattice, and the evaluation of the layer lines of the rotation diagram thus produced essentially contributed to an understanding of the relation which exists between the diffraction spectrum and the structure of cellulose.

The same year (1921) also brought the first attempt, by *Polanyi, (11)* to determine the dimensions of the unit cell, i. e. the smallest unit which still possesses the geometrical properties of the whole crystal lattice. Polanyi assumed the lattice, on which the cellulose crystal is built, to be of the rhombic-quadratic system and arrived at the dimensions expressed in A. U. (Å. U. = 10^{-8}cm = $0.1\mu\mu$) for a (horizontal) = 8.6, for b (vertical) = 10.3 and for c (forming the angle with a) = 7.8, b representing the length of the basic cell, parallel to the fiber axis. *(13)*

These dimensions being known the volume of the unit cell could be calculated, and from the volume and the mass of the anhydro glucose formula unit and the density of the cellulose, it was found that 4 glucose anhydrides could be placed within the unit cell. Again, the same value was found for cellulose preparations from very different sources which helped to support the hypothesis of their chemical identity whilst this actually should have only been of morphological interest.

As indicated earlier in this paper, the number 4 gave rise to much speculation, for it was the time when the idea was sponsored that cellulose may be represented by an association of monomeric-glucose-, cellobiose-, or similar lower anhydrides. Unit cell and cellulose molecule were assumed to be identical.

The basic cell as accepted by Polanyi caused difficulties in interpreting certain reflections, and the following years were devoted to the establishing of a quadratic form which would take care of all reflections observed. The endeavours in this direction were substantially aided by the investigations carried out on higher orientated preparations such as stretched Tunicin *(Herzog* and *Gonell* 1924) and of bacteria cellulose membranes (von Susich 1929), *(16)* Champetier 1933, *(14);* later Champetier (1933), *(15)* and Y. Khouvine (1934) *(17)* the diagrams of which were found to be in good agreement with those of ramie, hemp, and other fibers. Checking of previously obtained data thus led to the revision of the dimensions of the basic cell (a = 8.3; c = 7.9; and β = 84° the latter again revised to 78°), which indicated that the monoclinic system would allow the more satisfactory interpretation aimed at.

In the years of which I was just speaking (1923 to 1926) a new impetus to the development in the application of X-ray analysis to textile fibers and particularly to cellulose was being received from the work of *W. H. Bragg (18)* and his numerous pupils on the radii of atoms and the distances between atoms of homopolar compounds, particularly of Naphthalene and Anthracene, which enabled Bragg to calculate the diameter of the benzene ring.

Making use of these results and at the same time recognizing the necessity of bringing X-ray evidence into harmony with chemical evidence, *Sponsler* and *Dore (19)* constructed a picture of the possible structural arrangement of the glucose units in the basic cell of the ramie fiber which they presented to an audience at the 4th National Symposium on Colloid Chemistry at the Massachusetts Institute of Technology in 1926.

It is most interesting that a decision with regard to the structure of glucose to be selected for the arrangement within the unit cell could be made from 3 dimensional models carefully constructed to a scale based upon the atomic radii of carbon and oxygen and the distances C-C and C-O, given by W. H. Bragg, and it was found that the amylene oxide ring structure which on chemical evidence had just been suggested by Haworth, fitted best into Sponsler's lattice spacing as derived from X-ray data, and, for reasons of symmetry, the beta structure was given preference to the alpha structure

As regards the possible mode of linking between 2 glucose units of the chain it will be remembered that Sponsler and Dore did not think the exclusive 1-4 linking, as in cellobiose, to be in agreement with their X-ray data. Later on, *Meyer* and *Mark (20)* directed attention to the fact that the quadratic form Sponsler and Dore had chosen for the lattice is not capable of accounting for all diffraction lines observed and that their technique did not bring out certain lines which the fiber diagram actually shows. On the other hand, it appears rather doubtful whether X-ray data are at all capable of deciding such particular questions of chemical constitution.

However this may be, Sponsler and Dore's choice of alternating glucoside and ether linkings instead of glucosidic linkings only, did not actually matter as far as the principles of their conception of the arrangement of the glucose units within the basic cell are concerned. The most essential result was that the investigators recognized the repeat period (b) of 10.25 A. U. along the fiber axis—as evidenced by X-ray investigation—to be a figure dependent upon the chemical structure of the cellulose, for the diameter of one glucose unit, using Haworth's pyranose ring structure was calculated to be 5.13 A. U., that is just half of the repeat period. This means that in the unit cell, i. e. with the spacing of 10.25 A. U. on each chain, there occur 2 glucose units. This suggested that the constituent units are arranged in continuous chains, which run parallel to the fiber axis through the unit cell and that the latter contains a certain number of them, again in parallel arrangement, the number depending on the space which the unit cell is capable of accommodating (see Fig. 13).

Sponsler and Dore's quadratic cell accommodated 8 glucose units. Thus, they found themselves in good agreement with the chemical evidence of their time inasmuch as this evidence, as we have seen before, strongly pointed in the direction of long chains linked together by primary valency forces.

To these forces Sponsler and Dore attributed the chemical and mechanical stability of the cellulose, and they con-

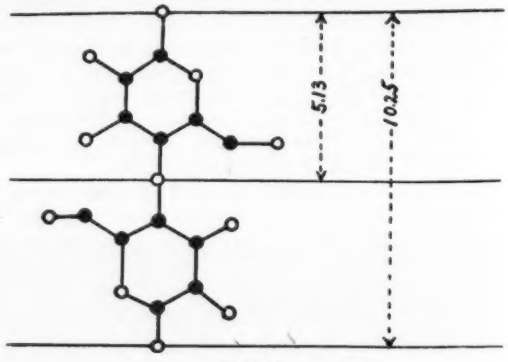

FIG. 13
Diagram of glucose units. (Sponsler and Dore).

cluded that these forces must be broken before the great tensile strength of the fiber suffers. The position of the chains with respect to each other are stabilized by secondary valency forces exerted by the quadrivalent oxygen atoms. These forces, however, are easier to break, which would explain the fact that the fibers possess rather little strength in direction perpendicular to the fiber length (see Fig. 14).

Sponsler and Dore's structure would also explain a number of physical phenomena observed on fibers after various treatments. It would account for the difference of thermal expansion in the two directions of the fiber, which was found to be much greater in lateral direction than in length direction, apparently due to the fact that there is more freedom of molecular movement in the cross direction. It also would account for the swelling in water or other liquids not attacking the cellulose chemically, which is small in longitudinal direction since there apparently is no opportunity for the molecules of these liquids to enter between the single units of the chain. In lateral direction, however, molecules find sufficient space to enter and in so doing widen the space still further *(21)*. This interpretation of the phenomenon of swelling was first given by *Katz*, to whom we owe so much knowledge on this subject, and was based on X-ray analysis *(22)*.

Finally, the structure would account for the chemical reactions to which cellulose is subjected. Thus, the fact that on acetylation, methylation, etc., fiber structure is retained, may be explained by assuming that the new groups shift themselves into the spaces between the longitudinal chains. This will occur the more easily the smaller the groups are and vice versa (a conception which later on was well supported by *Trillat* 1933 and 1934) *(23)*; but the linkings of the longitudinal chains, the skeleton of the fiber, are not destroyed. It is logical that Sponsler and Dore assumed the breakdown of the fiber structure under a more vigorous action of chemical treatment, such as hydrolysis for instance, to begin with the separation of the longitudinal chains from each other, that is the breakdown of the secondary valencies, which is quite in agreement with the concept of depolymerization as discussed earlier in this paper.

In this connection we may remember the relation between viscosity and chain length, and if viscosity indicates that, depending upon the way of isolation or pre-treatment, cellulose appears with most different chain lengths, it follows that the first step of any depolymerization must be the shortening of the chains and not the breaking up of lateral bonds. For alone the visibly unchanged structure of cellulose in its various depolymerized forms forces us to assume that in these products the chains are still united

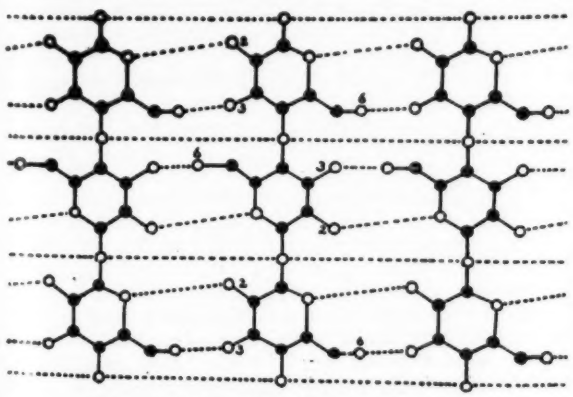

FIG. 14
Ramie fiber, tangential section. (Sponsler and Dore).

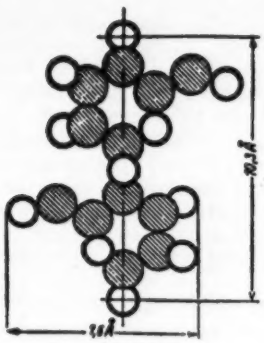

FIG. 15
Model of cellobiose.

in micellae. Hence, in such cases and unless the attack is not too severe, shortening of the chains must occur without destroying the micellae. This appears to be somewhat in disagreement with the experimental facts which indicate the primary valency forces to be stronger than the lateral bonds between the parallel running chains, and one should expect the weaker forces to break down more easily than the stronger ones. It would be interesting to have this discrepancy ventilated in the discussion which we shall have after the various papers.

It must be emphasized that Sponsler and Dore's most interesting work has given great impetus to the studies in the years which followed their presentation in Cambridge. It was particularly *K. H. Meyer (24)* and *Meyer* and *Mark (25)* who devoted much thought and experimental study to the problem in question. Their endeavours were facilitated through the ever growing accumulation of chemical evidence on questions of constitution, particularly the establishment of the cellobiose formula by *Haworth (26)*, as well as an abundance of X-ray data gathered from the study of numerous organic compounds, which revealed the distances between atoms to be equal (diamond, Ehrenberg 1926; crystallized ethane, Mark and Pohland 1927, etc.) or very closely equal (graphite, von Steiger 1925) *(27)*.

Following the same procedure as that which Sponsler and Dore applied, namely the construction of three-dimensional models of the constituent units from balls having a multiple of the atomic radii and distances established on other compounds and considering the inclination of the C-atom to arrange neighboring C-atoms tetrahedrically around itself, allowed to arrive at a very probable arrangement of the atoms in the molecules.

Of further help proved Staudinger's ideas on the structure of polymers as well as *A. Mueller* and *Shearer's (28)* and others' investigations of the Bragg school on long chains of fatty acids (1923 and 1927), and later on *Meyer* and *Brill's (29)* confirmation obtained on well-built crystals of lauric acid (1928), according to which the molecules were found to lie parallel to each other and the atoms in the chains to be arranged in zig-zag form.

In their endeavours to accommodate the glucose units in a basic cell, Meyer and Mark used the dimensions as established in 1921 by Polanyi. The length of the stretched out cellobiose of Haworth's (the β-form) is 10.3 A. U. that is the length of the repeat pattern along the fiber axis. Crystallographic considerations revealed that a diagonal screw axis runs along the fiber axis, and X-ray evidence that the screw component equals half of the repeat pattern in this direction, i. e., 5.12 A. U. Now, the lower part of Haworth's cellobiose formula being of the same length also shows this arrangement *(see Fig. 15)*.

By turning it through 180° and by shifting it upward

it will exactly cover the upper part of the formula. Combining evidence with structural arrangement, it followed that in the basic cell the cellobiose residues lie parallel to the b axis, and from calculations of the breadth (6 A. U.) and the thickness (3 A. U.) of the chain, Meyer and Mark arrived at the arrangement as shown in the picture *(Fig. 16)*. Comparing this arrangement with Sponsler and Dore's suggestion the new recognition to be derived from Meyer and Mark's work is that crystallographic evidence suffices to explain the existence of 2 glucose units as composing the repeat pattern of the fiber axis *(30)*.

During the following years manifold support could be gained for Meyer and Mark's suggestion, so by *Andress* (1929) and other investigators of Professor Berl's Institute in Darmstadt *(31)*, by *Astbury* (1931) *(32)*, although in the latter's picture the position of the primary valency chains is somewhat different, and by *Hengstenberg* (1929) *(33)*. This investigator directed attention to certain disturbances in the lattice of native fibers which are similar to those which are created by mercerisation. It is interesting to note that the changes of the lattice due to mercerisation so far were assumed to be to a great extent reversible, whilst very recently *Bancroft (34)* claimed them to be irreversible (1935).

Mark (35) in his very interesting book on the physics and chemistry of cellulose sums up the situation at the beginning of the year 1932 in saying that considering all X-ray data available, the primary valency structure as arrived at does not exist in an ideal order in native cellulose. It is now and then, more or less regularly interrupted by certain disturbances of the lattice which may be accidental or due to conditions of growth and which may be favoured by the occurrence in the lattice of other primary valency chains such as pentosans or of special groups.

Much experimental study was devoted to determining through X-ray analysis the size, the form, and the position of the micellae or crystallites in the various fibers. The first attempts go back to Scherrer and to Herzog in the year 1921, followed by *Herzog's* second calculation in 1926 *(36)*. An approximate value was obtained from the breadth of the hyperbolae (layer lines) of the diagram, and if we follow *Hengstenberg* (1928) *(37)*, the micella in native ramie cellulose presents itself as a rhombus which measures about 500 to 600 A. U. along the fiber axis and 50 by 50 A. U. across this direction. This estimate agrees quite well with that made by Herzog in 1926, and later on (1930), *Clark (38)* could verify these values by the use of relatively long X-ray wave lengths from position measurements of the spots on the diffraction pattern. That the micellae may be orientated by stretching would also indicate that they are of an oblong form. One micella would accommodate 1500 to 2000 glucose units. *Meyer* and *Mark* assumed the chain to contain 30-50 glucose units, from which would follow that 40-60 chains would compose 1 micella or crystallite *(39)*.

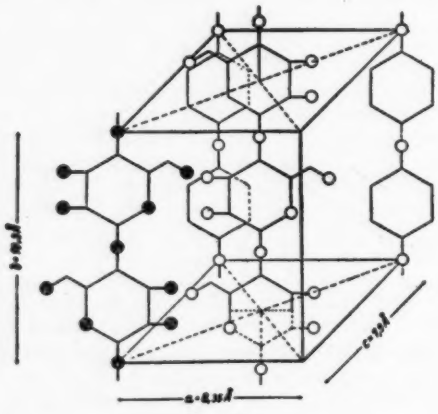

FIG. 16
Unit crystal cell of cellulose. (Meyer and Mark).

It will be remembered that the detection of the tetramethylglucose led Haworth to a chain of 100-200 glucose units which would mean that a smaller number of chains compose the micella, a result which later on could be confirmed in some other ways.

As to the position of the micellae in the various fibers we owe again to Herzog the first information. Already in 1921 it was pointed out that the micellae in the native-grown fibers are all orientated parallel to the fiber axis, in cotton spirally turned around the axis, whereas in artificial fibers and in films this orientation is missing, unless it is produced, as is possible to a great extent, by stretching *(40)*. In wood pulp fibers the arrangement varies from a direction nearly parallel to the axis in the inner part of the fiber to nearly at right angles in the surface. These findings have been confirmed by numerous investigations in the years which followed, and we may direct particular attention to the interesting work of more recent date (1932 and 1933) on the orientation of cotton fibers published by *Clark* and *W. Farr* and other co-operators and on the elastic and plastic properties of textile fibers by *Steinberger* (1934) *(42)*, as well as on micellar orientation and spiral structure of natural and artificial fibers by *Morey* (1934) *(43)*. It is interesting to note that Morey with his method of measuring polarisation of the fluroesence from fibers dyed with strongly fluorescent direct dyes, found the flax fiber to be of highest orientation, that is, exceeding that of ramie which so far was thought to be the best orientated cellulose fiber. The method allowed also to determine the degree of spiral arrangement in the fibers, and the latter was found to be distinctly higher in flax than in ramie.

Orientation of artificial fibers and other cellulose membranes by means of stretching has often been the subject of investigation, be it as a means of checking X-ray data obtained on native fibers *(44)* or for lifting the veil from the relation which exists between orientation of micellae and strength and other physical properties of the fibers *(45)*. Fullest orientation results in an increase of tensile strength by about 3 times and more whereby elongation of course decreases accordingly (about 1/5 of the original value). *Mark (46)*, in a very interesting lecture before the Paper Makers' Association of Great Britain in 1933 pointed out the very interesting relation which exists between elongation and the tendency of rayon fabrics to crease, which is very much disliked because it is irreversible. Thus, too much stretching, although bringing about highest tensile strength, results in lack of elasticity. In the natural silk thread elasticity and tensile strength are well balanced, for the outside layers, less orientated and therefore of greater elasticity, surround a highly orientated core of high tensile strength. By forcing a silk worm placed on a rotating glass rod to spin faster Mark succeeded in having produced a silk thread of greater orientation in the outside layers and thus of less elasticity.

It will be remembered that earlier in this paper attention was directed to the hypothesis that the cohesion between the links of the chain increases with increasing length of the chain. We did not hesitate to identify these forces with van der Waals' forces of molecular cohesion, and the additive character of these forces would be well illustrated in the long chain cellulose molecule. In addition to these forces there are those which hold the parallel chains in bundles. Some investigators as Sponsler and

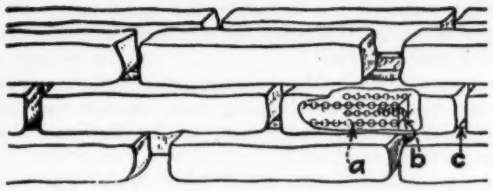

FIG. 17
Model of structure of cellulose fiber showing micellae. (Clark).

Dore, and others assume these forces to be secondary valencies exerted by tetravalent oxygen atoms. The chain bundles of certain varying length and certain breadth and thickness represent the crystallites or micellae. Finally there are tertiary forces sometimes called micellar forces, which hold the micellae together in the fibrillae, the first constituents of the fiber which may be detected under the microscope *(see Fig. 17)*.

A measure for the total of the various forces which stabilize the organic structure of the fiber and which equal the energy required to break them was found by *Meyer* and *Mark (47)* in the molecular heat of evaporation. This figure may be additively calculated from the increments of the single groups of the molecule, and good agreements between calculation and actually determined heat of evaporation was established. This figure calculated for 1 mol was called "molcohesion." The molcohesion of the glucose residue in cellulose was found to be 24,000 cal., and a chain of 60 glucose residues would render 1,500,000 cal.

From the fact that the diagram accounts for only 70-75 per cent of the cellulose fiber substance as being of crystalline nature it has been concluded that the rest consists of a cementing substance ("Kittsubstanz") deposited between the crystallites. The nature of this substance caused much discussion when it was first mentioned by Herzog. As far as I know it is still a secret and I may be allowed to leave possible elucidation on it to Professor Clark who also will inform us on the more recent and latest development in the X-ray field.

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Chapter III. The Micro Structure of Cellulose

By this is meant the morphological and histological arrangement of fiber elements as they may be detected with the various microscopical devices. The smallest elements which with certainty may be seen under the microscope are fibrillae sections, about 0.5 long and 0.3-0.5 in diameter. It appears that there is no important difference between the various terms which have been given to these smallest fibrillae sections. *Luedtke* (1931) *(1)* compares them with *Wiesner's* "dermatosomes" (1886) *(2)*, fragments obtained under the influence of hydrochloric acid and alkali. *Hess* and *Schultze (3)* called them just "crystals" (1927) and *Ritter (4)* "fusiform bodies" (1928) and "spherical units" (1930) *(5)*. It is assumed that the fibrillae (in the older literature called "primitive fibers" *(6)* represent rows of micellae, a great number of which compose the fiber. Some investigations of recent years now and then pointed in the direction that still smaller elements than these very small fibrillae sections may be seen under the microscope. However, such claims as for instance made by *Spierer* (1926) *(7)* and later by *Seifriz* (1931) *(8)* and *Thiessen* (1932) *(9)* could not be confirmed. We will hear more about this in Mrs. Farr's special report, I suppose.

The development in the fields of anatomy, morphology and histology of plant cells and cell walls of the last century is marked by the contributions of von Naegeli, von Mohl, Wiesner, von Hoehnel, Hanausek and others *(10)*, and it appears that the turning point was reached in von Naegeli's studies which led him to his micellar theory (1856) *(11)*. At the beginning of our century progress is connected with the names of Timberlake and Allen, Haberlandt, Reimers, Sponsler, Anderson, Balls, Frey and A. Herzog *(12)*, until within the period under review (1920 up to date) more or less significant contributions have been made also by a number of non-botanists, a fact which no doubt is due to the desire and the hope to arrive at a better understanding of chemical reactions on so complicated a structure as cellulose, by taking the various branches of botany into closest consideration.

This tendency, however, involves certain dangers if one is not fundamentally armed against the alluring but rather tricky manifestations of optics.

The time available does not allow to pay much attention to the chronological side of the development, and I believe it would serve the purpose best to show, very briefly, how we stand to date, leaving a more detailed criticism of the various views to Dr. Ritter, and probably also, to Dr. Lewis.

The fine structure of the cellulose fiber can, of course, not be discussed without considering the part which other, i. e., non-cellulosic substances, take in the building up of the cell wall, be it chiefly pectin in cotton and flax, or lignin, pentosans and hexosans in wood. Whereas it appears that the micellae consist of cellulose only—apart

from the still puzzling intra-micellar substance whose existence is deduced from X-ray analysis—microscopical analysis discloses lignin, which is not of a crystalline but an amorphous nature, and non-cellulosic carbohydrates to be deposited in the fibrillae. Lignin probably (and possibly the non-cellulosic carbohydrates) also is involved in producing the high physical strength of lignified tissues such as is manifested, for instance, in wood.

Since *Dippel* (1879) *(13)*, the fact has been accepted that the fibrillae are arranged in layers (lamellae) and it is these layers into and between which lignin and non-cellulosic carbohydrates are imbedded. This is illustrated in Fig. 18, representing the cross-section of a wood tissue which also may serve for a better understanding of the various views about the arrangement and the composition of the layers.

The middle lamella, the chief dividing line, already performed in the embryonic cell, seems to be the preferred layer for the deposition of and the impregnation with lignin, so that it appears as if this layer is composed of lignin only. Neither cellulose nor pectin could be detected, although *Scarth* (1929) *(14)* finds that the absence of the latter is not proven. Since lignin and the other non-cellulose substances are to be regarded as products of metabolism, the middle lamella in the embryonic cell very probably does not consist of any of these products, and one would have to go back to the protoplasm from which the layers originate to answer the question as to the original composition *(15)*.

In the picture we also recognize the secondary layer and we may imagine also that we see a primary layer as the surface of the fiber and a tertiary layer which is the inmost wall to the lumen and which plays an important part in Luedtke's conception of the cell wall arrangement in coniferous wood, whereas *Freudenberg (16)* doubts the existence of this layer.

The main source of cellulose is claimed to be the secondary layer in which also other carbohydrates are found.

From observations that the lignin in the cell wall is chiefly found in the middle lamella and the cellulose in the secondary layer, it would follow that the plant synthesizes these two main constituents during separate periods. From this, and since thus the greater part of the cellulose would not come into contact with the lignin, we may derive the conclusion that cellulose and lignin in the cell wall do not exist in chemical combination. Whether the same conclusion may be drawn with regard to a chemical combination between the pentosans, etc., and the lignin on the one side and the cellulose on the other appears still doubtful.

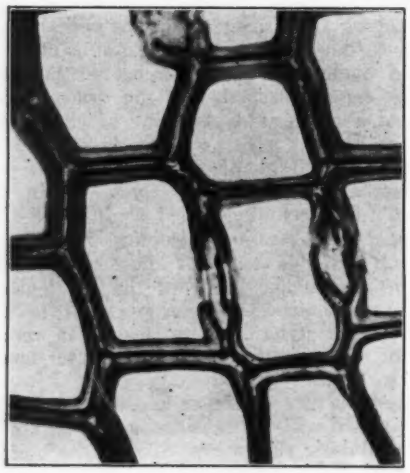

Fig. 18
Cross section of wood. (Spring fibers).

However, so far there seems to be little difference between the various investigators, except perhaps as regards the finer arrangement of the lignin within the middle lamella *(17)*.

Whereas the botanists view the cellulose itself as constituting the frame of the fiber, *Luedtke (18)* ascribes this frame or skeleton to a system of very fine skins within which the cellulose and the non-cellulosic carbohydrates are regarded as the filler. Such skins, whose composition is still unknown (they do not consist of cellulose nor of other carbohydrates) and the existence of which Luedtke believes to have proven in manifold ways, surround the fiber outside and inside. Thus cellulose in the isolated fiber is said to be found only beneath a fine skin, the primary layer. Also the cellulose is separated from the lumen by another skin, the tertiary layer. These skins extend in cross-direction and lengthwise through the whole cell wall. Besides, there are the so-called "transverse elements" which also may be made visible in many ways (carbonisation, etc.) and which divide the fiber and also the fibrillae into fiber and fibrillae sections, and the latter still further into still small sections, for which Luedtke suggests to reserve Wiesner's term "dermatosomes." All these sections into which the fibers and fibrillae disintegrate by various after-treatments (swelling, for instance) were found to be of distinct length.

The cotton fiber, the single hair cell, according to Luedtke, appears equipped with a similar skin system. The cuticle is assumed to consist of two skins. On swelling in cuprammonium the outer waxlike skin, comparable with the middle lamella of the wood tissue, is loosened in irregular pieces whereas the inner skin, the primary layer, remains with the membrane and thus takes part in the swelling. The latter is regularly retarded at the places where the transverse elements exist, and this is the cause of the well-known characteristic balloons in the swelling picture. In this connection attention may be directed to the most interesting work published by *Lewis* and *Carpenter* (1934) *(19)* and which shows the degree of swelling to be clearly dependent upon the past history of the fiber so that the swelling experiment may serve as a valuable test of the degree to which cooking and bleaching took place in the wood pulp manufacturing process.

With Luedtke's differentiation of the cuticle, which follows the observations earlier made by *Balls* and *Hancock* (1922) *(20)*, Wiesner's explanation of the swelling picture recently revived by *Hess* and *Akim* (1931) *(21)* seems to be abandoned. (According to Wiesner, the cuticle, representing only one single skin, on loosening, rolls itself together and surrounds the fiber at various places as a strangling string thereby impeding swelling at these places).

On the other hand, *Haller* (1933) *(22)*, although accepting the skin system, cannot agree to the existence of transverse elements in the cotton fiber and therefore still adheres to Wiesner's explanation, whereas *Katz* explains the swelling picture by internal tensions *(23)*

Finally *Ritter* (1928) *(24)*, as well as *Scarth* (1929) *(25)*, and also *Freudenberg* (1931) *(26)* assume the outside layer of the fiber to consist of fibrillae which are arranged tangentially to the fiber axis, an arrangement which Scarth has schematically demonstrated, and it is this arrangement of the fibrillae which Ritter makes responsible for the characteristic swelling picture. There seem to be still fundamental differences between the view put forward by these investigators and that of Luedtke.

and probably Dr. Ritter will enlighten us on these points in his special paper.

As regards the relationship which exists between the fibrillae and the micellae on the one side, and the fiber on the other, an idea may be derived from Luedtke's work. The dermatosomes, those smallest fibrillae sections, measure 0.5μ in length and 0.3-0.5μ in diameter and, based upon the figure for the length of the miscella as given by R. O. Herzog and Krueger (1926) with 60 times 5$\mu\mu$, one dermatosome would contain 8 micellae, united in a row. A row of 20-100 dermatosomes would make up one fibrilla of 0.3-0.5μ diameter and 15-16μ in length. Luedtke assumes the fibrillae to be united to "striae" and the striae to compose the layers which are cylindrically arranged around the lumen. Finally, the layers are lengthwise divided up into fiber sections by the transverse elements and the fiber sections, about 10-100 put together, make up the fiber.

It is interesting to note that in artificial fibers, although these are of micellar structure as are the native fibers, no fibrillar structure exists. This seems to justify Luedtke's differentiation between the fibrillae as "biological" and the micellae as "chemical" units.

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(11) v. Naegeli loc. cit. Chapter II, note No. 2.
(12) See Strassberger's Textbook of Botany, McMillan Co. London 1930 (6th edition).
(13) J. von Wiemer loc. cit.
(14) G. W. Scarth, Transaction Royal Soc. Canada *23*, Section V, 269 (1929).
(15) See V. Grafe, Die Chemie d. Pflanzenzelle, Gebr. Borntraeger, Berlin 1922, p. 92 et seq.
(16) K. Freudenberg, Cellulosechemie *12*, 263 (1931)
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(18) M. Luedtke, loc. cit; Cellulosechemie *13*, 169, 171 (1932); *14*, 1 (1933). See, however, P. Waentig, Cellulosechemie *10*, 84 (1929).
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(22) R. Haller, Helv. Chim. Acta, *16*, 383 (1933).
(23) J. A. Katz, in Hess' book, p. 709 and 728; K. Hess, C. Trogus and Assoc. Kolloid-Ztschr. *51*, 90 (1930).
(24) Ritter, loc. cit.
(25) Scarth, loc. cit.
(26) Freudenberg, loc. cit.

(To be concluded)

Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Power House

Points on Lubrication with Special Reference to Paper Making Machinery. J. S. S. Brame. World's Paper Trade Rev. 103: 140-144, 218-222 (Jan. 11 and 18). 342, 378, 380 (Feb. 1, 1935); Paper Maker & Brit. Paper Trade J. 89: TS6-9 (Jan., 1935); Pulp Paper Can. 36: 223-227 (April, 1935).—A brief discussion of some of the fundamental points and results of recent researches on lubrication, together with a consideration of the application of different types of lubricants for various paper mill services.—A. P.-C.

A General Outline of the Chief Improvements Effected in Steam Generation and Their Application to Industrial Boilers. V. Kammerer. Papier 38: 123-129, 219-228 (Feb., March, 1935).—A review of recent improvements in the steam generating equipment of central power plants, and of the possibility of applying them to industrial boiler plants.—A. P.-C.

Combating Ice Troubles in Paper Mill Water Power Developments. Chester Reed Earle. Paper Ind. 17: 27-29 (April, 1935).—An outline of some methods of combating ice troubles that have proved successful in the past.—A. P.-C.

Flocculation in the Treatment of Water. James Strachan. Paper Maker & Brit. Paper Trade J. 89: TS33-34 (March, 1935).—A brief discussion of the role played by flocculation in fresh water purification, boiler feed water softening, purification of white water, and filtration in general—A. P.-C.

Cambridge pH Meter. Anon. World's Paper Trade Rev. 103: 546 (Feb. 15, 1935).—A brief description of the instrument.—A. P.-C.

Temperature Controller. Anon. World's Paper Trade Rev. 103: 546 (Feb. 15, 1935).—A brief description of Mark II potentiometer type automatic recording temperature controller of Geo. Kent, Ltd.—A. P.C.

The Economics of Paper Mill Painting. A. H. Kennedy. Paper Ind. 17: 30-33 (April, 1935).—A discussion of the benefits to be derived in pulp and paper mills by the proper selection and application of paints.—A. P.-C.

Automatic Combustion Control. H. W. Arkell. Paper Maker & Brit. Paper Trade J. 88, No. 5, TS198-202, Nok 6: TS216 (Nov. and Dec., 1934).—A description and discussion of automatic combustion control equipment and its merits.—A. P.-C.

Use of S. K. F. Anti-Friction Bearings At the Svelvik Paper Mill. Industrie Papetiere 14: 70-71, 73 (March, 1935).—A saving of over 25% in power consumption was effected by substituting S. K. F. ball- and roller-bearings for plain bearings on a paper machine at the Svelvik mill, Norway.—A. P.-C.

Bearing Fundamentals. O. K. Graef. Paper Ind. 16: 835-841 (March, 1935).—A discussion intended to clarify some of the popular misconceptions of the mechanical and hydraulic actions that occur in bearings under various conditions.—A. P.-C.

Heat and Power Production and Transmission. F. P. Wilmer. Paper Trade J. 100, No. 8: 69-104 (Feb. 21, 1935).—Brief and authoritative résumé of developments in the production and transmission of heat and power during 1934.—A. P.-C.

Lubrication in the Paper Mill. Jean Defrance. Papeterie 56: 1130-1137 (Nov. 10, 1935).—A description of the groundwood and paper mills of Messrs. Matussière & Forest, at Ledar, France.—A. P.-C.

Miscellaneous

The Control of Dirt from Wood At the Mill. R. G. Belcher. Pulp Paper Can. 36: 127-128 (Feb., 1935).—A discussion of the sources of "dirt" in wood and of its prevention or elimination.—A. P.-C.

Dirt in Logs—Woodlands Department View. W. A. E. Pepler. Pulp Paper Can. 36: 129, 132 (Feb., 1935).—A brief discussion of the forms of "dirt" harmful to newsprint which originate in the woods or on the drive, and more especially those that lend themselves to some control by the Woodlands Department.—A. P.-C.

Relative Permanence of Papers Exposed to Sunlight. I. George A. Richter. Ind. Eng. Chem. 27, 432-439 (April, 1935).—This is a continuation of the general experimental study of the stability of paper when exposed to natural sunlight. Various means of retarding the usual rapid degradation of paper when exposed to sunlight were attempted. The study also includes the use of accelerants to promote oxidation of cullulose in the presence of light rays. The experimental findings available at this time are summarized and various suggestions are offered for future investigations.—A. P.-C.

Static Electricity in Paper. Anon. Paper Ind. 16, 845 (March, 1935).—A brief outline of the cause and prevention of static electricity in paper.—A. P.-C.

Some Paper Destroying Fungi. A. Sartory, R. Sartory, J. Meyer and H. Baumli. Papier 38: 43-53 (Jan., 1935).—A number of paper destroying fungi were isolated, and the following were identified which had marked cellulolytic properties: *Cladosporium herbarum,* var. *cellulosae* (*Pers*); *Aspergillus fumigatus,* var. *cellulose* (*Hopf*); *Fusarium coereuleum* (*Lib.*) *Sacc.*; *Actinomyces cellulosea* Krainsky, and *Monilia cellulosophaga* n. sp. Pure cultures were made and examined to ascertain their morphological characteristics and biological properties; the attack of cellulosic fibers was observed microscopically. The destruction of cellulose can take place either by solution of the fiber walls or by fluidification of the fiber contents. This fact is apparently related to the diastogenetic fungi, as there are species producing strictly endogenetic cellulolytic enzymes and others secreting exogenetic enzymes. These fungi can be divided into 2 classes according to the aspect of the colonies on the surface of the paper: (1) the attacked portion of the paper is exactly superposed to the surface of the colony; (2) the colony is in the center of the attacked area, which extends considerably beyond the colony. The organisms are attached to the paper in 2 different manners: (1) they grow solely on the surface and develop by means of asexual reproductive organs of external origin (*Aspergillacae*); (2) they are strongly attached to and buried in the cellulosic fibers (*Cladosporium* and Monilia).—A. P.-C.

The Structure of Fiber and Its Influence in the Making of Paper. W. Boyd Campbell. Pulp Paper Can. 36: 178-181 (March, 1935); Paper Trade J. 100, No. 7: 35-38 (Feb. 14, 1935).—A general discussion presenting a picture of the essential elements of fiber structure and indicating how these operate in paper making.

Anglo-Newfoundland Development Co., Ltd. W. A. Lawrence. Pulp Paper Can. 36: 157-175 (March, 1935).—A history of the founding and development of the company, with a description of the Grand Falls newsprint mill and other plants of the company in Newfoundland.—A. P.-C.

Research Essential to Industry. E. W. Beatty. Pulp Paper Can. 36: 85-86, 93, 96 (Convention Issue, 1935).—An address.—A. P.-C.

Retrospect on the Progress of Paper Making. Papeterie 56: 1170-1177, 1222-1229, 1274-1281 (Nov. 25, Dec. 10, 25, 1934).—Historical notes on the manufacture of certain grades from 880 to 1934.—A. P.-C.

Paper Machine Speed in Relation to Weight of Paper Per Square Meter and to Mesh of Wire. A. Van der Stickel. Papeterie 57: 301-302 (April 10, 1935).—A table is presented giving paper machine speeds (for fine and semi-fine papers, respectively) and wire-mesh suitable for the manufacture of papers weighing from 10 to 700 g. per sq. m.—A. P.-C.

Flocculation in Paper Making. James Strachan. Paper Maker & Brit. Paper Trade J. 89: TS1-2, TS17-20 (Jan., Feb., 1935).—A brief discussion of fiber flocculation or tendency to the formation of aggregates in suspension.—A. P.-C.

The Cost of Faults in a Paper Mill. D. McNeill. World's Paper Trade Rev. 103: 176-182, 254-258 (Jan. 19, 25) 335-338 (Feb. 1, 1935); Paper Makers & Brit. Paper Trade J. 89: TS22-25, 32 (Feb., 1935).—A discussion of various common everyday happenings which more or less tend to upset systematic costing in a jobbing mill.—A. P.-C.

Electricity in Paper. Papier 38: 331-332 (April, 1935).—A brief discussion with a description of the Holweg low-frequency ionizer for discharging electricity from paper, either on the paper machine or in the converting plant.—A. P.-C.

Experiments in Printing. P. H. Prior. World's Paper Trade Rev. 102: 1874-1882, 1918, 1944-1954 (Dec. 21 and 28, 1934); 103: 60, 62 (Jan. 4, 1935).—Experiments are described which were carried out on a hand-driven proofing press to study the essential factors of printing, *viz.,* type surface, ink film, the surface to be printed on (usually paper) and pressure. The press gives uniform results which enabled the pressure and ink film to be measured and controlled, so that different papers can be compared for printing qualities. Ink deposits on paper show considerable irregularity when examined under the microscope, and this irregularity controls the general appearance of the print. Various hypotheses are discussed to account for the un-inked areas, and such evidence as is available favors a lack of contact between the ink film and the paper due to their relative contours at the moment of printing, while surface tension effects and wettability appear to be unimportant. The press was found very useful for predicting the relative behavior of different papers on a commercial press, with regard to evenness and depth of printing, strike-through, and, less directly, set-off; a plea is made for the development of means of estimating and expressing these properties in definite numerical values.—A. P.-C.

Labor Cost of Production in the Paper and Pulp Industry. John P. Hagenauer. Paper Trade J. 100, No. 17: 29-39 (April 25, 1935).—Wage and employment statistics are presented showing that the U. S. pulp and paper industry has fully met the requirements of the National Industrial Administration.—A. P.-C.

The Possibilities of Scientific Management in the Paper Industry. K. Ross. World's Paper Trade Rev. 103: 1076, 1078, 1117-1120 (April 5, 1935).—A general discussion.—A. P.-C.

United States Patents on Paper Making. First Quarter, 1935. Clarence J. West. Paper Trade J. 100, No. 15: 33-35 (April 11, 1935).—A list in numerical sequence of patents relating to pulp and paper making issued at Washington during Jan., Feb. and March, 1935.—A. P.-C.

Waste Liquors and Gases of the Paper Industry

A Survey of Recent Domestic and Foreign Patent Literature on the Utilization of Waste Liquors and Waste Gases of the Pulp Industry, 1931-1935

(Third Compilation.)

Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

The first section of this compilation on waste liquors and gases of the paper industry appeared in PAPER TRADE JOURNAL 81, nos. 14-26 (Oct.-Dec., 1924) and in *Technical Association Papers* 9:146-181 (1926); the second section was published in PAPER TRADE JOURNAL 92, no. 3:48-56; no. 4:50-56; no. 5:46-51 (Jan. 15-29, 1931); the present or third section brings the list up to the present time.

In preparing this list, all patents abstracted in *Chemical Abstracts*, the *Technical Section* of the PAPER TRADE JOURNAL and *Der Papier-Fabrikant* have been read and those relating to the utilization of waste liquors and gases have been selected; it is not claimed that the list is complete, for probably many patents mention the use of waste liquors but such use is not mentioned in the abstracts of the patents. However, it is believed that the most important patents have been collected.

The following compilation is arranged first by country and then by the number of the patent. An author and subject index completes the work.

The first two compilations contained 885 patents. While the last patent in the second compilation is number 788, the inserts brought the number up to 885 and therefore this compilation begins with number 886.

Additions or corrections to this list will be appreciated by the compiler.

United States Patents

886. 1,779,226. Oct. 21, 1930. LINN BRADLEY AND EDWARD P. MCKEEFE. TREATING BLACK LIQUOR FROM PULP MANUFACTURE.

Black liquor from the manufacture of pulp with the use of soda cooking liquor is sulphited with sodium bisulphite to form sodium sulphite, and the sulphited liquor is completely causticized to produce a solution containing both caustic soda and sodium sulphite which may be used for further wood digestion. Sodium acetate may be recovered by concentration and crystallization.

887. 1,780,638. Nov. 4, 1930. ROBERT B. WOLF. SULPHITE PAPER PULP.

In the recovery of acid in the sulphite-pulp process, a constant pressure is maintained in the relief line from the digester, the gases and liquids are cooled and are then discharged from the relief line into an acid absorbing medium. Apparatus is described.

888. 1,787,953. JAN. 6, 1931. GEORGE A. RICHTER. DIGESTING RAW CELLULOSE MATERIAL SUCH AS WOOD.

Material such as wood is cooked in a sulphurous acid liquid, residual sulphurous acid groups in the liquor are oxidized (suitably by sodium hypochlorite or sodium peroxide) and the liquor is rendered alkaline (suitably by the addition of sodium hydroxide) and the cellulosic material is further cooked in the alkaline liquor.

889. 1,787,954. JAN. 6, 1931. GEORGE A. RICHTER. PROCESSING OF RAW CELLULOSIC MATERIALS.

The cellulosic material is cooked in sulphurous acid liquor, the liquor is neutralized while the sulphur content is maintained in combined state and alkaline substances, including sodium sulphite, are added to render the liquor alkaline, followed by further cooking of the cellulosic material in the alkaline liquor.

890. 1,791,077. FEB. 3, 1931. LUDWIG WEBER. FUEL BRIQUETS.

Particles to be briquetted, such as fuels, ores or flue dust, are mixed with very finely divided clay of great plasticity, and this mixture, before briquetting, is moistened with sulphite waste liquor.

891. 1,791,476. FEB. 3, 1931. GUSTAF HAGLUND. WOOD PULP.

Wood chips, before cooking with a liquor such as a sulphite solution, are preliminarily soaked in a cooking liquor produced in the usual manner without any addition of waste liquors from previous cooking operations, and, after removal of part of the cooking liquor, the chips are cooked with a cooking liquor mixed with waste liquor from a previous cooking operation or with such liquor from a cooking apparatus still in action.

892. 1,793,264. FEB. 17, 1931. SERGEI I. CHUVIKOVSKII AND GRIGORY I. LIACHOVETZKII. COOKING SULPHITE CELLULOSE.

Liquor leaving the cookers is conducted to an evaporator where it is heated by fresh steam and the vapors are returned to the cookers. Various details of apparatus are described.

893. 1,794,006. FEB. 24, 1931. FERNANDO FALLA. FURNACE FOR RECOVERY OF VALUES FROM WASTE WOOD-PULP LIQUOR RESIDUUM.

A steam boiler is operated by the furnace gases, and cooling gases are supplied to the boiler space at a point beyond the inlet of the furnace gases so that the furnace gases will be cooled to an extent sufficient to precipitate entrained "chemical ash" from them. Various details of construction are described.

894. 1,795,557. MARCH 10, 1931. ERIK HÄGGLUND TREATING BLACK LIQUOR FROM THE SODA-PULP PROCESS.

The liquor is subjected to a heat and pressure treatment to precipitate most of the organic substance present as carbonaceous and pitchy material. After separation of the liquor from the precipitate thus formed, it is causticized (the acetate content being left substantially unchanged) and concentrated, and a portion of the sodium acetate content is crystallized out. Another portion of the causticized liquor is used to increase the alkalinity of the black liquor, and a further portion is used to act upon pulp-forming fibrous material; crystallized sodium acetate and volatile products are recovered. An arrangement of apparatus is described.

895. 1,795,754. MARCH 10, 1931. LINN BRADLEY AND EDWARD P. MCKEEFE. PULP FROM WOOD.

Wood is digested in a cooking liquor containing most of its soda in the form of a sulphite of sodium; the residual liquor is subjected to a treatment including a reducing furnacing operation to yield a product containing sodium

carbonate and a relatively large amount of sodium sulphide; and the sodium sulphide thus formed is utilized in an alkaline cooking liquor to cook an additional quantity of wood. Residual liquor from this second cooking operation is subjected to a furnacing to yield a product containing sodium carbonate and a lesser proportion of sodium sulphide than was present in the alkaline cooking liquor, and the furnace product is subjected to a sulphiting to produce a cooking liquor containing a quantity of sodium sulphite at least equivalent to any sodium thiosulphate present; and the cycle is repeated, by use of the last-mentioned cooking liquor in the first stage of the process.

896. 1,795,755. MARCH 10, 1931. LINN BRADLEY AND EDWARD P. MCKEEFE. PULP FROM WOOD.

Relates to a cyclic process, in which one lot of wood is cooked in a liquor containing sulphur dioxide and sodium bisulphite and another lot of wood is cooked in a liquor containing sodium hydroxide and a lesser quantity of sodium sulphide, residual liquors from these two operations being mixed and suspended matter separated. This is followed by addition of a sodium compound such as sodium hydroxide capable of redissolving remaining suspended organic material, concentrating, treatment of a portion of the concentrated liquor by a reducing furnacing operation to form sodium carbonate and a considerable amount of sodium sulphide, treatment of another portion of the liquor by two furnacing to produce mainly sodium carbonate without much sodium sulphide, forming separate liquors from these two furnace products, causticizing the liquor containing the greater proportion of sodium sulphide to form a cooking liquor containing sodium hydroxide and sulphur dioxide and not containing any objectionable quantity of sodium thiosulphate.

897. 1,795,756. MARCH 10, 1931. LINN BRADLEY AND EDWARD P. MCKEEFE. PULP FROM WOOD.

Relates to a generally similar process to 1,795,755, in which, however, the wood cooked in alkali is treated with a larger proportion of sodium sulphide than sodium hydroxide when freshly charged into the digester.

898. 1,797,585. MARCH 24, 1931. DAVID D. PEEBLES. TREATING WASTE LIQUORS SUCH AS THOSE OF SODA AND SULPHATE PULP MANUFACTURE.

The liquor is dehydrated to a high concentration by continuously circulating the heated liquor through a closed expansion chamber while simultaneously continuously removing evolved vapors from the chamber, and the concentrated waste liquor is burned in a furnace with gases evolved from the chamber.

899. 1,797,678. MARCH 24, 1931. LINN BRADLEY AND EDWARD P. MCKEEFE. TREATING WASTE FROM CHEMICAL WOOD-PULP MANUFACTURE.

The inorganic content with admixed organic matter of a concentrated mixture of the waste residual liquor resulting from the digestion of cellulosic material such as wood chips in a solution of sodium-sulphur salts (containing most of the sodium in the form of a sulphite of sodium) and the residual liquor resulting from the digestion of cellulosic material in an alkaline solution containing sodium compounds (the major portion of which are sulphur-free sodium compounds, such as sodium hydroxide) is subjected to furnacing under reducing conditions to produce a furnace product containing the sodium compounds mainly as sodium carbonate and sodium sulphide, and the resulting sodium compounds are treated to produce an alkaline cooking liquor for further use as a digesting agent for cellulosic material.

900. 1,799,277. APRIL 7, 1931. WALTER O. BORCHERDT. DEFLOCCULATING COLLOIDS.

For promoting the deflocculation of solids in a liquid medium such as mineral pulps, the material is treated, without added heat, with prepared sulphite waste liquor.

901. 1,801,945. APRIL 21, 1931. ALFRED H. WHITE. REGENERATING LIQUORS SUCH AS SPENT LIQUOR FROM SODA OR SULPHATE PULP MANUFACTURE CONTAINING ALKALI SULPHUR COMPOUNDS AND ORGANIC MATTER.

The liquors are burned with calcium carbonate to form a solid material containing quicklime and alkali metal sulphates. The temperature of the solid material is maintained above 900° and it is mixed with sufficient fresh liquor containing organic combustible material to effect a substantial reduction of the sulphates to sulphides without lowering the temperature below about 540°.

902. 1,803,738. MAY 5, 1931. ALFRED M. THOMSEN. SULPHITE PULP.

From 5 to 50 per cent of the waste liquor is added to fresh cooking acid in making up the acid for a subsequent charge. Lime is added to the remaining waste liquor, the precipitate thus formed is separated and after washing the precipitate is returned to the acid-making system.

903. 1,807,320. MAY 26, 1931. ALBERT D. MERRILL. DIGESTING FIBROUS CELLULOSIC MATERIAL WITH ACID CALCIUM SULPHITE LIQUOR.

Milk of lime and sulphur dioxide are fed to a pressure accumulator and used to form acid liquor, and the latter is mixed with digester relief liquor. An arrangement of apparatus is described.

904. 1,808,773. JUNE 9, 1931. CHARLES A. GRONDONA. RECOVERY OF ALKALI METAL SALTS FROM BLACK LIQUOR.

A high-temperature zone of combustion is maintained in a furnace by the introduction of black liquor, and additional black liquor and salt cake are introduced into the furnace between this zone and the lower portion of the furnace. Various details of apparatus are described.

905. 1,809,427. JUNE 9, 1931. JOHN H. SPOHN, JR. RECOVERY OF VALUES FROM "BLACK LIQUOR" OBTAINED IN PAPER-PULP MANUFACTURE.

A black liquor is injected into a furnace to effect concentration of the liquor and burn out organic matter. Combustion products and associated vapors are scrubbed with water to recover chemical values and remove obnoxious odors. The scrubbing liquid is allowed to stand in order to effect separation of sulphur sludge, etc. An arrangement of apparatus is described.

906. 1,810,472. JUNE 16, 1931. EDWARD H. FRENCH. RECOVERY OF RESINOUS SUBSTANCES IN WOOD-PULP MANUFACTURE.

Rosin is recovered from alkaline liquors containing resinates by a process including passing an acid gas, such as sulphur dioxide, through the liquors to liberate at least part of the rosin content. An arrangement of apparatus is described.

907. 1,811,268. JUNE 23, 1931. GUSTAF HAGLUND. SULPHITE CELLULOSE.

In preparing a liquor having a high concentration of dissolved organic matter by use of waste liquor from a previous cellulose boiling, the waste liquor is mixed with an alkali bisulphite solution, with addition of necessary quantities of sulphur dioxide.

908. 1,811,783. JUNE 23, 1931. ERNEST ELGERUS. BLEACHED WOOD PULP.

Wood is treated for several hours at superatmospheric pressure with hot waste sulphite liquor pumped directly from the digester without employing any heat other than that contained in the liquor, and the treated wood is then subjected to mechanical disintegration in an edge mill or the like.

909. 1,812,675. JUNE 30, 1931. JAMES BADDILY, ARNOLD SHEPHERDSON AND ANTHONY J. HAILWOOD. DISPERSING DYES WITH SULPHITE CELLULOSE WASTE.

A composition readily dispersed in water comprises a dye paste or powder and the product of the moderate oxidation of sulphite cellulose pitch with nitric acid.

910. 1,812,693. JUNE 30, 1931. ANTHONY J. HAILWOOD. PRODUCTS SUITABLE FOR DISPERSING DYE FROM SULPHITE PITCH.

Sulphite pitch is treated under pressure with ammonia solution at temperatures above 110° degrees C.; the product may be improved in color by boiling with caustic soda and zinc dust.

911. 1,812,832. JUNE 30, 1931. HAROLD R. RAFTON. ALKALINE FILLER FOR PAPER PULP.

An alkaline filler such as lime sludge in wet condition is combined with pulp to prepare the material for shipment.

912. 1,815,328. JULY 21, 1931. GEORGE A. RICHTER. RECOVERY OF VALUES FROM SPENT COOKING LIQUORS FROM PULP MANUFACTURE.

Spent cooking liquor containing sodium-sulphur compounds is smelted in an oxidizing atmosphere to produce a smelt containing sodium carbonate and sodium sulphate, an aqueous smelt solution is formed and the latter is carbonated to precipitate sodium bicarbonate and the precipitation is removed. An arrangement of apparatus is described.

913. 1,816,394. JULY 28, 1931. OSKAR A. MULLER. WORKING UP MATERIALS (SUCH AS PINE SHAVINGS) CONTAINING LIGNIN AND CELLULOSE.

The moistened material is chlorinated and then treated with an organic solvent such as boiling alcohol miscible with water and containing an inorganic acid such as hydrochloric acid so as to eliminate the chloro-lignin and remove such substances as are soluble in the organic solvent from the cellulose, the chloro-lignin is separated from the extract obtained, the organic solvent is distilled, tanning substances are extracted and the aqueous residue is fermented,

914. 1,818,901. AUG. 11, 1931. ARLINGTON H. MALLERY. GAS FROM CARBONACEOUS MATERIAL SUCH AS OIL RESIDUUMS AND STEAM.

Carbonaceous material such as oil residuum or black-liquor waste and superheated steam are forced into a substantially closed heated chamber maintained at a temperature above the "kindling temperature" of the hydrocarbons in the materials and under pressure, and continuous and simultaneous variations in pressure, temperature, velocity of travel and concentration of resulting gases are produced (in an apparatus which is described) so that the discharged gases may be used for fuel or as a source of liquid hydrocarbons.

915. 1,821,138. SEPT. 1, 1931. LINN BRADLEY AND EDWARD P. MCKEEFE. TREATING BLACK LIQUOR FROM THE SODA-PULP PROCESS.

An aluminum compound which is capable of combining with free caustic alkali is added to form alkali metal aluminate, and aluminum hydroxide is precipitated substantially free from inorganic impurities, from the remaining solution.

916. 1,923,519. SEPT. 15, 1932. ALFRED M. THOMSEN. SULPHITE PAPER PULP.

An acid calcium sulphite solution is decomposed with sodium sulphate, the calcium sulphate formed is separated, wood chips are digested with the liquod thus produced, pulp is separated from the spent liquor, the liquor is neutralized and calcium sulphate is precipitated from it as calcium carbonate by the addition of sodium carbonate. The calcium carbonate sludge is separated, the liquor is evaporated to a sirupy consistency and is incinerated under reducing conditions; the resulting ash is dissolved in water, the contained sodium carbonate is separated from sodium sulphite (as by crystallization) and the sodium carbonate is returned to the process for neutralizing the liquor as described.

917. 1,823,752. SEPT. 15, 1931. CARL H. MICHELSON. REFINING THE "SOAP" FLOATING ON THE WASTE LIQUORS OF CELLULOSE MANUFACTURE.

For recovering fatty and resinous acids from the so-called "soap" floating on the waste liquors obtained in the manufacture of sulphate or "sodium" cellulose, the "soap" is treated with sulphite waste liquor.

918. 1,826,224. OCT. 6, 1931. WILLI SCHULTZE. LIQUID FATTY ACIDS FROM TALLOEL.

A process of decomposing talloel to obtain the liquid fatty acids substantially free from resinic acid comprises distilling the talloel at a decomposing temperature in a high vacuum (8 mm. of mercury or less) in the absence of steam and foreign gases until the first trace of resinic acid begin to come over, and then discontinuing the distillation.

919. 1,827,080. OCT. 13, 1931. MAX GADE. FERMENTATION PRODUCTS FROM SULPHITE WASTE LIQUOR.

For removal of the aldehyde fractions passing over with the first runnings in the distillation of "sulphite liquor spirit," a series of mashes is fermented, alcohol is distilled from each mash, and the first runnings are separated and are continuously conducted into another mash which is still fermenting for subjection to further fermentation, so that the aldehydes produced in each mash are removed during the fermentation of the next succeeding mash.

920. 1,827,832. OCT. 20, 1931. CHARLES R. MCKEE. COATING OR SIZING COMPOSITION.

An aqueous viscous adhesive coating is made from glue, starch, sulphite waste liquor and a small quantity of a sulphonated oil such as Turkey-red oil.

921. 1,928,096. OCT. 20, 1931. TANDY A. BRYSON. CENTRIFUGAL PURIFICATION OF FLUENT MATERIALS SUCH AS PAPER-PULP LIQUOR.

Apparatus and various details of operation are described.

922. 1,828,279. OCT. 20, 1931. HENRY L. BROWN. RECOVERY OF CHEMICALS FROM DIGESTED LIQUOR.

Foam is separated from black liquor and chemicals are separately recovered from the foam.

923. 1,828,511. OCT. 20, 1931. BROR N. SEGERFELT. METHOD OF PRODUCING CELLULOSE.

Cellulose material, such as wood chips, is digested with liquor such as an alkaline white liquor and the cellulose produced is afterward washed in diffusers. The strongest waste liquor obtained from the diffusers from a previous boiling is evaporated and the evaporated waste liquor is added as supplemental liquor to the fresh digester liquor for obtaining the required quantity of liquid in the digester.

924. 1,828,592. OCT. 20, 1931. MAX BOMMER, GUILLAUME DE MONTMOLLIN, HARSOLAW FROLICH, FRITZ GRIESHABER, WOLFGANG JAECK AND FRIEDRICH FELIX. PREPARATION OF DYESTUFFS WHICH ARE OF VALUE FOR OBTAINING GAST TINTS ON THE DIFFERENT FIBERS AND PROCESS OF MAKING SAME.

Preparations in dry form are formed of dry water-insoluble dye such as vat dyes of the anthraquinone series, together with at least 20 per cent of dry sulphite waste liquor.

925. 1,823,367. NOV. 17, 1931. THOMAS L. DUNBAR. PROCESS AND APPARATUS FOR RECONDITIONING SULPHITE COOKING ACID.

The digester relief is passed through a separator to separate the liquid and gaseous fractions. The liquid fraction is passed through a heat exchanger where it heats up cold acid being fed into an acid accumulator, and the gaseous fraction is introduced into the bottom of the accumulator where it is absorbed under pressure by the already partly heated acid.

926. 1,833,029. Nov. 24, 1931. Alfred Mackay. Treatment of animal fibers.

A slurry comprising animal fibers, such as hide scraps in aqueous suspension, is treated with a by-product resulting from the digestion of cellulose fibers, such as a lignin material which serves as a binder.

927. 1,833,313. Nov. 24, 1931. Linn Bradley and Edward P. McKeefe. Treating residual liquors such as those from pulp manufacture by use of alkali metal sulphite cooking solution.

The residual liquor is evaporated and its residue is calcined and smelted, the resulting melt is dissolved and the solution may be treated (suitably by use of sulphur dioxide) to decompose sulphide present and form a thiosulphate cooking liquor. Numerous details and modifications of procedure are described.

928. 1,833,386. Nov. 24, 1931. Adolph W. Waern. Rotary horizontal furnace suitable for smelting "black liquor" residue from pulp manufacture.

929. 1,834,676. Dec. 1, 1931. Linn Bradley and Edward P. McKeefe. Pulp from wood.

One lot of material is digested in a liquor containing a sulphite of sodium. Another lot is digested in a sodium hydroxide liquor. Water is separated (as by evaporation) from the residual liquors of each operation and the sodium organic compounds in the residual liquors are decomposed by furnacing them together, thus producing a furnace product comprising sodium carbonate and sodium sulphide. A portion of the sodium carbonate thus recovered is causticized to form a cooking liquor comprising sodium hydroxide. Sodium dioxide is introduced into a hot solution that contains a substantial portion of the sodium carbonate and sodium sulphide recovered, thus removing hydrogen sulphide from the solution and converting some of the sodium content of the sodium sulphide and of the sodium carbonate into a sodium sulphite which is used in a succeeding digestion.

930. 1,834,845. Dec. 1, 1932. Rupert S. Jones and Stanley Pearson. Treating waste liquors such as those containing alkaline sulfides.

Waste liquor containing alkaline sulphide is first treated with acid such as sulphuric acid in the presence of a material containing the sulphur dioxide radical such as sodium bisulphite or sulphur dioxide, and is then treated with caustic alkali in the presence of a compound of the magnesium groups such as zinc sulphate or magnesium oxide until the whole liquor is alkaline, in order to obtain a clear effluent.

931. Reissue 18,268. Dec. 15, 1931. Guy C. Howard. Treating waste sulphite liquor.

A reissue of original patent no. 1,699,845.

932. 1,836,563. Dec. 15, 1931. Wm. T. Webster and Charles L. Wagner. Foam abatement and chemical recovery from foam such as that produced in pulp manufacture from resinous woods.

Various details of apparatus and operation are described for treating the foam with hot gas and liquid spray falling countercurrently.

933. 1,838,109. Dec. 29, 1931. George A. Richter. Furfural from sulphite waste liquor.

Spent acid sulphite liquor is neutralized, concentrated, acidified and heated sufficiently to vaporize the furfural formed, and the latter is removed from the vapors evolved.

934. 1,839,062. Dec. 29, 1931. Roy G. Tellier. Argil-carbin gel.

A ge suitable for purifying liquids is prepared by acting upon argil with an alkali liquor such as waste soda-pulp liquor in the presence of organic matter, followed by dehydration of the colloid gel at temperatures sufficiently high to cause destructive distillation of the organic component of the colloid gel.

935. 1,840,157. Jan. 5, 1932. Charles F. Cross and Alf Englestad. Lignone derivatives suitable for use in protective paints.

A stable aqueous dispersion is produced by the use together of water, a substance such as coal tar or wood tar normally immiscible with water, and water-soluble condensation products of the soluble lignone derivatives obtainable by the treatment of wood with an aqueous solution containing sulphurous acid anions. Ferric chloride and ferric hydroxide also are added.

936. 1,842,296. Jan. 19, 1932. Noel Statham and Thomas G. Leek. Electrolytic cell suitable for treating brine or waste pulp-mill liquors.

Structural features.

937. 1,843,464. Feb. 2, 1932. John Traquair. Paper.

In preparing paper-forming stock from raw material such as straw, a supply of mild alkali steeping liquor is maintained at a temperature below its boiling point and at a low pressure, and the raw material is passed at a predetermined rate through this alkaline liquor to loosen the bonding constituents; steeped material is withdrawn from the liquor and the associated black liquor is removed from the material (as by filtration) and the black liquor is reconditioned to form fresh steeping liquor which is added to the supply first mentioned.

938. 1,844,018. Feb. 9, 1932. Wilhelm Sailer. Tanning agent.

A tanning material comprises the halogenated reaction product of waste liquor resulting from the treatment of vegetable fibrous material with sulphite, together with hydrogen peroxide and an enzyme, such as a peroxidase.

939. 1,844,019. Feb. 9, 1932. Wilhelm Sailer. Tanning agent.

Animal hides are pre-tanned with a halogen reaction product obtained by bringing sulphite cellulose liquor into reaction with hydrogen peroxide and then halogenating as by treatment with chlorine or bromine or both.

940. 1,846,672. Feb. 23, 1932. Linn Bradley and Edward P. McKeefe. Preparation of pulping liquor.

The liquor is obtained by evaporating a residual liquor from the treatment of wood with caustic soda and sodium-sulphur compounds and calcinating the residue, smelting it to obtain a mixture composed largely of sodium carbonate and sodium sulphide, treating this mixture with water and sulphiting part or all of the solution.

941. 1,847,111. March 1, 1932. Albert H. Hooker. High alpha-cellulose.

Sulphite fiber is converted into high alpha-cellulose by treatment with dilute sodium hydroxide solution, the concentration of the effluent liquor is restored and the liquor is then used for conversion of wood fiber into soda pulp the effluent from the soda-pulp operation is purified and regenerated and the purified liquid is used for production of high alpha-cellulose, and the cycle is repeated.

942. 1,847,589. March 1, 1932. Arnold Brobeck. Method of heating sulphite liquor.

In order to prevent the formation of incrustations on the

heating surfaces of heat exchangers, the sulphite liquor is divided into a large number of relatively thin tube-like streams defined by the heating surfaces, applying heat at a temperature of 110° to 185° C. to the inner surfaces, of the tube-like streams, and forcing the liquor streams at all points to travel at a velocity of at least 1.5 meters per second so as to prevent boiling of the liquor and precipitation of calcium monosulphite on the heating surfaces.

943. 1,847,709. March 1, 1932. Webster E. Byron Baker. Sodium lignosulphonate.

In preparing a concentrated sulphite cellulose extract containing practically all of its salts in the form of sodium compounds, sulphite waste liquor is neutralized with an alkaline-earth hydroxide and concentrated, freed from substantially all sulphates and sulphites (suitably by milk of lime) and then treated with a concentrated solution of sodium carbonate chemically equivalent to the quantity of alkaline-earth metal contained in the extract (thereby precipitating practically all the alkaline-earth metals as carbonates) and the solution containing sodium lignosulphonate is separated and acidified with an organic acid such as acetic acid which does not substantially ionize and which has a relatively low dissociation constant in order to prepare a tanning composition.

944. 1,848,292. March 8, 1932. Guy C. Howard. Lignin derivatives from waste sulphite liquor.

Waste sulphite liquor is treated with solid-phase caustic lime to produce precipitated organic material containing approximately 32 parts of organic combined sulphur to 500 parts organic matter and substantially free from carbohydrate substances; the precipitate is separated and steam cooked under pressure with sufficient lime alkalinity to cause a dimimution in the proportion of organic combined sulphur through formation of calcium sulphite and to yield solid organic material of diminished solubility in aqueous acid solutions suitable for use as a pigment, in rubber or paper products, etc.

945. 1,848,981. March 8, 1932. Frederick J. Wallace. Adhesive cement.

Clay is dispersed in a mixture of waste sulphite liquor concentrated to about 30° Bé. and casein solution, to form an adhesive suitable for use with linoleum or oilcloth, etc.

946. 1,852,264. April 5, 1932. Erik L. Rinman. Dry distillation of waste liquors from soda-pulp manufacture.

Waste liquor is treated with barium hydroxide and then evaporated to a dry mass capable of being pulverized, and is subjected to dry distillation to produce products such as methyl alcohol, methyl ethyl ketone, acetone, acetone oil, etc.

947. 1,854,428. April 19, 1932. Bror N. Segerfelt. Removing malodorous gases formed in sulphate and soda pulp manufacture.

The gases are brought to their dewpoint and treated with hydrocarbons of the terpene or camphor groups.

948. 1,856,558. May 3, 1932. Guy C. Howard. Treating waste sulphite liquor.

Caustic lime is added to precipitated crystals of calcium sulphite, and the crystals are subjected to treatment conducive to crystal growth and are recovered.

949. 1,859,888. May 24, 1932. Geo. A. Richter. Regenerating spent alkaline liquor from digestion of cellulosic material.

Spent alkaline liquor, such as results from cooking wood chips with alkaline sodium compounds, is treated with sulphuric acid to coagulate organic matter and produce a liquor containing alkali metal sulphate, the coagulated organic matter is separated, and the liquor is acidulated with sulphur dioxide for acid digestion of cellulosic material.

950. 1,860,043. May 24, 1932. Matthias Ludwigsen. Printing ink.

A vehicle is used formed by intermixture of waste sulphite liquor, alkali such as sodium hydroxide and phosphoric acid.

951. 1,860,465. May 31, 1932. Gustav Komarek. Sulphite waste liquor for making fuel briquets.

Briquets are provided with a deliquescent abrasion-resistant coating by separately applying a delinquent material, such as calcium chloride and an abrasion-resisting film-forming substance such as sulphite waste liquor, to the surface of the briquet without substantially reducing the deliquescence of the coating.

953. 1,860,848. May 31, 1932. Linn Bradley and Edward P. McKeefe. Wood pulping process.

Wood is cooked in a non-acid sodium sulphite liquor and another batch of wood is cooked in a cooking liquor containing sodium sulphide as the main cooking constituent; sodium compounds are recovered from the residual liquor of each of the cooking operations and are each used in preparing liquor for the other operation.

954. 1,862,243. June 7, 1932. John Strindlund. Apparatus for recovery of acid and heat in connection with digestion of materials such as sulphite cellulose.

Numerous structural details are described.

955. 1,863,663. June 21, 1932. Vincent A. Lauderman. Pigment for coated paper.

Lime sludge is converted into a pigment suitable for use in coating paper by neutralizing substantially all the free alkali by the use of aluminum sulphate and grinding.

956. 1,864,619. June 28, 1932. George A. Richter. Cyclic process of fiber liberation.

Wood is digested in an alkaline solution of sodium sulphite. Pulp is separated from the spent liquor. The inorganic content of the spent liquor is smelted and its combustible content is burned; smelted inorganic compounds are recovered and combustion products from the smelting operation are passed in contact with like spent liquor for recovery of the soluble content in the combustion products.

957. 1,867,593. July 19, 1932. George A. Richter. Cyclic pulping process.

In a cyclic process, raw material is cooked in a non-acid solution of sodium sulphite without completing fiber liberation and in an alkaline liquor to effect complete fiber liberation. Spent liquors from both cooking steps are mixed, the inorganic content of the mixture is smelted in a reducing atmosphere to produce sodium carbonate and sodium sulphite, sodium carbonate is crystallized from the smelt and is treated with sulphur dioxide and water to produce a non-acid liquor for further use in the process, and the rest of the smelt is used for forming alkaline liquor for further cooking.

958. 1,870,944. Aug. 9, 1932. Linn Bradley and Edward P. McKeefe. Wood pulp.

Wood is cooked with a liquid containing a sulphite of sodium and constituents of the residual liquor are treated under reducing conditions to form a product containing sodium sulphide which is used for preparing a liquor in which wood is cooked; residual liquor from the last-mentioned cooking is treated to form a different cooking liquor containing sodium hydroxide as its main active constituent and wood is cooked with this liquor, residual liquor from this operation being treated to regenerate a cooking liquor.

959. 1,877,219. Sept. 13, 1932. Linn Bradley and Edward P. McKeefe. Chemical wood-pulp residual-liquor treatment.

Waste sulphite liquor is treated with an addition of alkaline liquor formed by dissolving the sodium carbonate and sodium sulphite produced in another step of the process, the mixed liquors are rendered non-acid, and some sodium thiosulphate is formed in the mixture. It is then concentrated and solid constituents are subjected to a reducing furnace treatment to form a melt containing sodium carbonate and sodium sulphide (the latter compounds being dissolved and a portion of them used as already mentioned).

960. 1,878,828. Sept. 20, 1932. Charles F. Cross and Alf. Engelstad. Dispersing agents derived from lignone.

For producing aqueous dispersions of substances normally immiscible with water, such as coal tar or residual mineral oil, the substance is mixed with a non-gelatinized concentrated solution obtained by the action of chromic acid in a concentrated solution of the soluble lignone derivatives obtainable by the treatment of wood substance with an aqueous solution containing sulphur dioxide anions.

961. 1,879,503. Sept. 27, 1932. Erik L. Rinman. Removal of silica from black liquor.

Black liquor is treated with bauxite or other suitable compound of a metal, the silicate of which is substantially insoluble in the alkaline solution, so as to precipitate such silicate in the solution, and the solution is then treated with an absorption agent such as cellulose fiber or sawdust capable of absorbing the silicate, and the absorption agent and absorbed silicate are separated from the solution.

962. 1,881,557. Oct. 11, 1932. Gustaf O. W. Heijkenskjöld. Yeast.

In the utilization of nutrients such as sulphite waste liquor for yeast production, yeast propagation is started in a solution of relatively high sugar concentration and propagation is continued during addition of a wort containing acid liquid derived from wood, of toxic character to yeast and containing sugar.

963. 1,885,918. Nov. 1, 1932. Wm. H. Kenety. Apparatus for recovery of relief material in processes such as digestion of wood with sulphite solution.

Various structural features are described.

964. 1,887,246. Nov. 8, 1932. Evald Pyhälä. Refining and "decolorizing" raw sulphate soft soap.

A solution of the raw soap is treated with a dilute peroxide solution while hot, the reaction solution is salted, bottom water is tapped off, the soap is washed with a small quantity of water and is salted, and washing water is tapped from the refined and decolorized soap.

965. 1,888,581. Nov. 22, 1932. Leavitt N. Bent. Rosin recovery from rosin containing soap formed in pulp manufacture from resinous woods.

The rosin is precipitated by means of carbon dioxide and separated.

966. 1,889,405. Nov. 29, 1932. Edward H. French. Water-soluble resinate from black-liquor rosin.

Rosin such as that from black liquor is dissolved in a water-insoluble volatile solvent, such as gasoline, and sufficient alkali, such as sodium carbonate, is added to neutralize at least the major portion of the rosin in the presence of water in insufficient quantity to cause the formation of an emulsion; the water present is distilled off while replacing any solvent also distilling, and the precipitated resinate is separated from the remaining liquid.

967. 1,890,491. Dec. 13, 1932. Friedrich Bergius, Friedrich Koch and Eduard Faerber. Molded Products from lignin.

Dry, granular, porous, brittle, deacidified substantially pure lignin residue from hydrolyzing vegetable material, such as wood with hydrochloric acid of high concentration, is pressed in a mold to form products such as fuel or building material of self-sustaining coherent character without use of any added binder.

968. 1,892,100. Dec. 27, 1932. Linn Bradley and Edward P. McKeefe. Treatment of black liquor.

The solution is treated, at a temperature of 60° C. or higher, with available sulphur dioxide sufficient to form a volatile sulphide from the sulphur content of the sodium sulphide (as by the use of sodium sulphite and sodium bicarbonate) and after removing sulphide-sulphur at least a portion of the resulting solution is treated with available sulphur dioxide under conditions to form sodium bicarbonate without substantial loss of carbon dioxide and the resulting solution is further used for treating the solution containing sodium sulphide.

969. 1,893,539. Jan. 10, 1933. Ralph S. Edmondson and Mathew Holmes. Casting abrasive-faced articles such as stair treads, etc.

A mold surface is provided with a layer of holding material such as fire clay or flour paste for retaining the abrasive material in place, abrasive material such as emery or carborundum is applied as a layer to this holding material and treated with a viscous or adhesive material such as concentrated sulphite liquor, and, after drying these materials, molten metal is introduced into the mold.

970. 1,893,540. Jan. 10, 1933. Ralph S. Edmondson and Mathew Holmes. Casting abrasive-faced articles such as stair treads, etc.

Relates to a method similar to 1,893,539, in which a solution of sodium silicate is applied and dried before introduction of the molten metal.

971. 1,894,620. Jan. 17, 1933. Otto Kress. White filler product from sulphate pulp lime mud.

Green liquor obtained in the sulphate process of pulping wood is treated with lime to form a lime mud and a white liquor; the white liquor is separated and the lime mud is oxidized by admixture with calcium hypochlorite, the oxidized mud is washed and filtered and finally dried and ground.

972. 1,895,775. Jan. 31, 1933. Preston R. Smith. Use of sulphite waste liquor for producing emulsions.

A water-external-phase bituminous emulsion is produced by the addition of a salt of a metal of the third analytical group such as iron, alumimum or chromium sulphate to an approximately equal amount of concentrated sulphite waste liquor followed by the use of the resulting product as an emulsifying agent with bitumen.

973. 1,899,526. Feb. 28, 1933. Max Phillips. Varnish comprising lignin.

A solvent mixture of two or more solvents selected from ethyl alcohol, methyl alcohol, isopropyl alcohol, benzine, acetone, ethyl acetate, amyl acetate and furfural is used with lignin (such as may be obtained by digesting corn cobs in alkali solution and causing the resulting solution to react with sulphuric acid or hydrochloric acid) to form a varnish which is suitable for use on wood, etc.

974. 1,900,320. March 7, 1933. Charles L. Wagner and Horace Freeman. Recovery chemicals from waste liquors such as those from sulphate pulp manufacture.

The material is destructively distilled, the combustible products of the distillation are consumed and a fused pool of non-combustible products is formed and accumulated until reduction is substantially complete. Apparatus is described.

(To be continued)

Must Comply With Guffey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 23, 1935—The paper industry, along with all other industries selling to the United States government apparently will have to purchase its coal from mines which are operated by producers complying with the Guffey Act. At least that is what the National Bituminous Coal Commission has held in a ruling which it has submitted to the Procurement Division of the Treasury Department.

The Commission has notified this division that "every contract (for any public work or service) entered into by or on behalf of the government" requires the application of Section 14 of the Act.

The letter was in response to a request from the division for an interpretation of Section 14, and follows a statement of the Commission that it "will apply to railroads serving the government in the transportation of mails as well as firms and individuals contracting with the government for the supplying of materials." The Procurement Division has directed that provisions requiring the use of code coal be inserted hereafter in government contracts.

The Commission states that "the only construction which is consistent with the liberal and remedial purpose of Section 14(b) requires that that section be applied to every (government) contract * * *."

It is also pointed out in the Commission's letter that the term "contractor" as used in Section 14 applies to subcontractors.

October Newsprint Statistics

Production of newsprint in Canada during October 1935 amounted to 266,515 tons and shipments to 266,679 tons, according to the Newsprint Service Bureau. Production in the United States was 79,746 tons and shipments 81,817 tons, making a total United States and Canadian newsprint production of 346,261 tons and shipments of 348,496 tons. During October 29,744 tons of newsprint were made in Newfoundland and 1,942 tons in Mexico, so that the total North American production for the month amounted to 377,947 tons. Total production in October 1934 was 342,857 tons.

The Canadian mills produced 126,824 tons more in the first ten months of 1935 than in the first ten months of 1934, which was an increase of 6 percent. The output in the United States was 43,621 tons or 5 percent less than for the first ten months of 1934, in Newfoundland 17,308 tons or 7 percent more, and in Mexico 616 tons more, making a total increase of 101,127 tons, or three and two tenths percent.

Stocks of newsprint paper at Canadian mills were reported at 73,579 tons at the end of October and at United States mills 14,379 tons, making a combined total of 87,958 tons compared with 90,193 tons on September 30, 1935.

New Finnish Sulphate Mill Starts

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., November 25, 1935—The new Finnish sulphate mill erected by the Enzo-Gutzzeit Tornator concern started work September 24 with an initial output of 80,000 metric tons of unbleached sulphate annually. Plans have been made, however, so that this figure can be raised to 120,000 metric tons without difficulty. It is understood that already over 40,000 tons of the mill output have been placed.

Low Cost Centrifugal Pumping Unit

An eight page bulletin has been issued recently by the Lawrence Pump & Engine Company, Lawrence, Mass. describing their Electropump—a compact, low cost centrifugal pumping unit for small and moderate capacities.

The Electropump is directly coupled to drip-proof, ball-bearing electric motors. The impeller is of the enclosed type and is mounted, keyed and locked on the extension of the motor shaft. The pump is for operation against heads up to 150 ft. or 65 lbs. in a single stage unit and twice the head or pressure when furnished in a two stage unit.

The Electropump is particularly fitted for circulating hot and cold water or brine, for water supply systems and booster service, low pressure boiler feeding, condensate returns, air conditioning apparatus, transfer of oil and other liquids, for swimming pools, golf courses, general service in factories, mills, office buildings, hospitals and apartments.

In this compact pump, the ball bearing motor and pump are built into one unit and the number of rotating parts are kept down to a minimum. This type of construction makes a self-contained, light-weight, easily portable unit that can be operated equally well in vertical, horizontal or inclined positions.

All units are thoroughly tested under conditions similar to those found in the field and given the efficiency ratings are most conservative. Complete performance curves and data on any size pump will be furnished by the Engineering Department of the Lawrence Pump & Engine Company.

The eight page bulletin contains a complete description of the Electropump and is illustrated with pictures and cross-sectional diagrams of the actual equipment. Several pages are also devoted to tables giving heads and capacities for the various pumps.

Bedford Pulp Co. Insures Employees

The Bedford Pulp and Paper Company, Inc., paper manufacturer, of Big Island, Va., has adopted a triple coverage group insurance program providing more than 250 employees with life insurance, accidental death and dismemberment protection and weekly accident and sickness benefits. The life insurance and accidental death benefits each total approximately $300,000. Announcement was made by M. E. Marcuse, president.

The program, which is being underwritten by the Metropolitan Life Insurance Company, is on a cooperative basis whereby the employer and employees share the cost. Individual coverage is determined by occupation, and ranges, in the case of both life insurance and accidental death insurance, from $1,000 to $2,000—the accidental death insurance being payable in addition to the life insurance. The sickness and accident insurance benefit for rank and file employees is $8 a week, and for department heads, assistant foreman, foreman and master mechanics, $12 a week. The weekly benefit will be paid, for a specific period, in case of sickness, or if injury is incurred while an employee is off the job.

Dismemberment coverage provides for the payment of from $1,000 to $2,000 for the loss of any two members—such as an eye and a limb—and one half the amount if the loss is confined to one member.

In addition to the insurance, the group program includes the periodical distribution of literature pertaining to the conservation of health and the prevention of disease.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 23, 1935

CIGARETTE PAPER

Champagne Paper Corp., Lafayette, Havre, 600 cs.

WALL PAPER

W. H. S. Lloyd & Co., American Farmer, London, 3 bls., 2 cs.; F. J. Emmerich, Hamburg, Hamburg, 3 bls.

WALL BOARD

Treetex Corp., Sydland, Sweden, 2,335 bdls.; Treetex Corp., Gripsholm, Gothenburg, 1,502 bdls.

NEWSPRINT

N. Y. Evening Journal, Markland, Liverpool, N. S., 496 rolls; N. Y. Tribune, Markland, Liverpool, N. S., 1,719 rolls; World Telegram, Markland, Liverpool, N. S., 219 rolls; Bridgeport Herald, Markland, Liverpool, N. S., 46 rolls; Brooklyn Daily Eagle, Markland, Liverpool, N. S., 526 rolls; Clinton Paper Corp., Markland, Liverpool, N. S., 510 rolls; Bank of Montreal, Cornerbrook, Cornerbrook, 4,309 rolls; ———, Bergensfjord, Oslo, 664 rolls; Jay Madden Corp., Scanstates, Kotka, 788 rolls; Walker Goulard Plehn Co., Hamburg, Hamburg, 55 bls.; Perkins Goodwin & Co., Hamburg, Bremen, 87 rolls.

PRINTING PAPER

Oxford University Press, Scythia, Liverpool, 6 cs.; Steiner Paper Corp., Westernland, Antwerp, 9 cs.

WRAPPING PAPER

Chase National Bank, Gripsholm, Gothenburg, 1,925 rolls; Standard Products Corp., Black Falcon, Antwerp, 2 cs., 1 roll; Globe Shipping Co., Hamburg, Hamburg, 50 rolls; Jay Madden Corp., Hamburg, Bremen, 134 rolls.

LINER BOARD PAPER

Corrugated Container Corp., Ili, Thorold, 372 rolls.

FILTER PAPER

H. Reeve Angel & Co., Inc., American Farmer, London, 10 cs.; P. H. Petry & Co., Hamburg, Hamburg, 100 bls.

DRAWING PAPER

H. Reeve Sngel & Co., Inc., American Farmer, London, 6 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Westernland, Antwerp, 31 cs.; Phoenix Shipping Co., Hamburg, Hamburg, 4 cs.; C. Happel, Hamburg, Hamburg, 2 cs.; Glove Shipping Co., Hamburg, Bremen, 10 crates; ———, Hamburg, Bremen, 2 cs.

METAL COATED PAPER

K. Pauli Co., Hamburg, Bremen, 29 cs.

TRANSPARENT PAPER

Takamine Corp., Shinko Maru, Kobe, 4 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., American Importer, Liverpool, 11 cs (duplex);

DECALCOMANIAS

Sellers Transportation Co., Hamburg, Hamburg, 7 cs.; Sellers Transportation Co., Hamburg, Bremen, 6 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., American Importer, Liverpool, 3 cs.; W. J. Byrnes, Berengaria, Southampton, 2 cs.

COLORED PAPER

Borden, Riley Paper Co., Westernland, Antwerp, 4 cs.; International F'd'g Co., Hamburg, Hamburg, 8 cs.

STENCIL PAPER

International F'd'g Co., Black Falcon, Antwerp, 6 cs.

CARD BOARD

American Express Co., Hamburg, Hamburg, 50 cs.; International F'd'g Co., E. Francqui, Antwerp, 4 cs.

MISCELLANEOUS PAPER

Iwai & Co., Nagara Maru, Kobe, 20 cs.; Hans Paper Corp., Nagara Maru, Yokohama, 14 cs.; T. N. Fairbanks, Nagara Maru, Yokohama, 22 cs.; Japan Paper Co., Nagara Maru, Kobe, 11 cs.; Keller Dorian Paper Co., Pr. Monroe, Marseilles, 11 cs.; E. Fougera & Co., Lafayette, Havre, 21 cs.; Coty Processing Co., Lafayette, Havre, 6 cs.; The Borregaard Co., Inc., Gripsholm, Gothenburg, 5,294 rolls, 315 bls.; National Pulp & Paper Co., Inc., Gripsholm, Gothenburg, 1,716 rolls; Lunham & Reeve, Inc., Gripsholm, Gothenburg, 81 rolls; E. J. Anhalt Co., Shinko Maru, Kobe, 5 cs.

RAGS, BAGGINGS, ETC.

Royal Manfg. Co., E. Francqui, Antwerp, 172 bls. cotton waste; E. J. Keller Co., Inc., Cypria, ———, 73 bls. paper stock; Chase National Bank, Sypria, Barcelona, 35 bls. rags, 87 bls. cotton waste; Bank of N. Y. Trust Co., Cypria, Barcelona, 55 bls. dark cottons, 104 bls. tares, 59 bls. bagging; ———, Cypria, Barcelona, 173 bls. old pickers; Bank of N. Y. Trust Co., Cypria, Valencia, 85 bls. rags; ———, American Importer, Manchester, 32 bls. old strings; ———, American Farmer, London, 37 bls. flax canvas; ———, American Farmer, London, 65 bls. paper stock; E. J. Keller Co., Inc., Westernland, ———, 179 bls. rags; ———, Quaker City, Leith, 124 bls. bagging; Manufacturers' Trust Co., Quaker City, Dundee, 115 bls. paper stock; ———, Quaker City, Dundee, 403 bls. paper stock; E. J. Keller Co., Inc., Black Falcon, ———, 70 bls. bagging; Irving Trust Co., Black Falcon, Antwerp, 57 bls. bagging; Castle & Overton, Inc., Argentino, Buenos Ayres,

139 bls. dark cottons, 69 bls. baggings; I. Abela & Co., Maria Trieste, 65 bls. rags; ———, Hamburg, Hamburg, 23 bls. cotton waste, Banco Coml. Italiane Trust Co., Hamburg, Hamburg, 81 bls. paper stock; ———, Hamburg, Bremen, 138 bls. cotton waste; J. J. Ryan & Son, Shinko Maru, Shanghai, 300 bls. cotton waste; C. Tennant Sons Co., Shinko Maru, Shanghai, 50 bls. cotton waste; Royal Manfg. Co., Shinko Maru, Kobe, 100 bls. cotton waste; E. J. Keller Co., Inc., Bilderdyk, ———, 95 bls. bagging.

GLUE STOCK

———, Scythia, Liverpool, 880 bags hide cuttings; ———, Hamburg, Hamburg, 25 bags bone glue.

OLD ROPE

Banco Coml. Italiane Trust Co., Cypria, Barcelona, 255 coils; Banco Coml. Italiane Trust Co., American Farmer, London, 56 coils; Chase National Bank, American Farmer, London, 39 coils; Manufacturers' Trust Co., American Farmer, London, 114 coils; ———, American Farmer, 55 coils; Banco Coml. Italiane Trust Co., Cristobal Colon, Pasages, 200 coils; Banco Coml. Italiane Trust Co., Cristobal Colon, Gijon, 164 coils; Banco Coml. Italiane Trust Co., Cristobal Colon, Vigo, 45 coils; ———, Quaker City, Leith, 80 coils.

CHINA CLAY

English China Clays Sales Corp., Scythia, Liverpool, 20 casks.

WOOD PULP

Stora Kopaarberg Corp., Sydland, Sweden, 1,000 bls. dry pulp, 202 tons; ———, Sydland, Sweden, 165 bls. chemical, 27 tons; Lagerloef Trading Co., Sydland, Kemi, 9,920 bls. sulphite, 1,664 tons, 760 bls. sulphate, 126 tons; Price & Pierce, Ltd., Sydland, Wallvik, 150 bls. sulphite; Bulkley Dunton & Co., Heddernheim, ———, 2,375 bls. wood pulp; ———, Heddernheim, Hernosand, 3,177 bls. sulphate, 530 tons; ———, Heddernheim, Hernosand, 2,850 bls. sulphite, 475 tons; Johaneson Wales & Sparre, Inc., Heddernheim Sundsvall, 250 bls. chemical, 750 bls. sulphite, 678 bls. dry pulp; ———, Heddernheim, Sundsvall, 450 bls. sulphate; E. M. Sergeant Pulp & Chemical Co., Bergensfjord, Oslo, 150 bls. chemical; Perkins Goodwin & Co., Bergensfjord, Oslo, 250 bls. sulphite; Irving Trust Co., Bergensfjord, Oslo, 375 bls. chemical; ———, Bergensfjord, Sarpsborg, 150 bls. sulphite; The Borregaard Co., Inc., Bergensfjord, Sarpsborg, 908 bls. sulphate; Perkins Goodwin & Co., Gripsholm, Gothenburg, 413 bls. sulphate; J. Anderson & Co., Gripsholm, Gothenburg, 250 bls. sulphite; D. M. Hicks, Inc., Gripsholm, Gothenburg, 210 bls. sulphite; Gottesman & Co., Inc., Gripsholm, Gothenburg, 1,800 bls. sulphate; Johaneson Wales & Sparre, Inc., Scanstates, Copenhagen, 334 bls. wood pulp, 50 tons; Lagerloef Trading Co., Scanstates, Kotka, 200 bls. sulphite, 33 tons; Lagerloef Trading Co., Scanstates, Helsingfors, 152 bls. wood pulp, 25 tons, 918 bls. sulphite, 152 tons; E. J. Keller Co., Inc., Scanstates, ———, 336 bls. wood pulp, 50 tons, E. J. Keller Co., Inc., Hamburg, ———, 335 bls. wood pulp, 50 tons; Castle & Overton, Inc., Hamburg, Hamburg, 2,185 bls. wood pulp, 431 tons; Bank of N. Y. Trust Co., Hamburg, Hamburg, 420 bls. wood pulp, 84 tons; J. Anderson & Co., Hamburg, Hamburg, 600 bls. wood pulp, 101 tons; Bulkley Dunton & Co., Deutschland, ———, 300 bls. wood pulp.

WOOD PULP BOARDS

Fiber Case & Novelty Co., Gripsholm, Gothenburg, 9 bls.; Jay Madden Corp., Scanstates, Kotka, 177 rolls, 202 bls.; G. H. MacFadden & Bro., Hamburg, Hamburg, 257 bls.; Phoenix Shipping Co., Hamburg, Bremen, 45 bls.

ALBANY IMPORTS

WEEK ENDING NOVEMBER 23, 1935

Gottesman & Co., Inc., Murjek, Sweden, 1,000 bls. wood pulp; Bulkley Dunton & Co., Murjek, ———, 2,250 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 23, 1935

American Express Co., Scythia, Liverpool, 53 bls. rags; G. F. Malcolm, Inc., Scythia, Liverpool, 19 cs. tissue paper; Elliott Addressing Machine Co., Nagara Maru, Yokohama, 5 cs. paper; Bank of Montreal, Cornerbrook, Cornerbrook, 4,127 rolls newsprint; E. J. Keller Co., Inc., Black Falcon, ———, 30 bls. bagging; Royal Manfg. Co., Black Falcon, Antwerp, 200 bls. cotton waste. American Express Co., Black Falcon, Antwerp, 142 rolls wrapping paper; New England Waste Co., Shinko Maru, Shanghai, 169 bls. pickers; Gottesman & Co., Inc., Sydland, Sweden, 250 bls. wood pulp; Bulkley Dunton & Co., Sydland, ———, 1,475 bls. wood pulp; Bulkley Dunton & Co., Heddernheim, ———, 150 bls. wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 23, 1935

———, Exporter, Algiers, 218 bls. rags; ———, Quaker City, London, 175 coils old rope; J. J. Jones Co., Quaker City, London, 203 bls. rags; ———, Quaker City, Hamburg, 80 bls. rags; ———, Quaker City, Dundee, 43 bls. paper stock; Castle & Overton, Inc., Black Falcon, Antwerp, 70 bls. rags; Van Oppen & Co., Black Falcon, Antwerp, 263 bls. rags; Castle & Overton, Inc., Scanstates, Wiborg, 804 bls. wood pulp, 160 tons; Lagerloaf Trading Co., Scanstates, Helsingfors, 125 bls. sulphate, 25 tons, 950 bls. sulphite, 156 tons; Jay Madden Corp., Scanstates, Helsingfors, 557 rolls wrapping paper.

BALTIMORE IMPORTS

WEEK ENDING NOVEMBER 23, 1935

Gottesman & Co., Inc., Lagaholm, Sweden, 2,000 bls. wood pulp; Bulkley Dunton & Co., City of Norfolk, ———, 800 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING NOVEMBER 23, 1935

Bulkley Dunton & Co., Heddernheim, ———, 8,250 bls. wood pulp; ———, Heddernheim, Hernosand, 1,500 bls. sulphate, 250 tons; Mead Sales Co., Heddernheim, Sundsvall, 1,476 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING NOVEMBER 23, 1935

Gottesman & Co., Inc., Delaware, Sweden, 1,150 bls. wood pulp.

CHARLESTON IMPORTS

WEEK ENDING NOVEMBER 23, 1935

W. Garretson Co., Shinko Maru, Shanghai, 205 bls. bagging; Chase National Bank, Shinko Maru, Kobe, 800 bls. bagging.

NORFOLK IMPORTS

WEEK ENDING NOVEMBER 16, 1935

Lagerloef Trading Co., Sagoporack, Wiborg, 637 bls. sulphate 106 tons, 918 bls. sulphite 154 tons; Lagerloef Trading Co., Sagoporack, Kotka, 1,050 bls. sulphate, 210

tons; Loumar Textile By-Products Co., Black Heron, Antwerp, 166 bls. bagging; Irving Trust Co., Lehigh, Manchester, 67 bls. bagging; ———, Lehigh, Liverpool, 134 bls. bagging.

TAMPA IMPORTS

WEEK ENDING NOVEMBER 16, 1935

Tampa Paper Co., City of Fairbury, Kotka, 30 rolls newsprint.

NEW ORLEANS IMPORTS

WEEK ENDING NOVEMBER 16, 1935

Parsons & Whittemore, Inc., Minsterland, ———, 250 bls. wood pulp; M. Sone, Tortugas, Sundsvall, 720 bls. wood pulp.

MONTREAL IMPORTS

WEEK ENDING NOVEMBER 16, 1935

Gottesman & Co., Inc., Fernebo, Sweden, 12,840 bls. wood pulp; Gottesman & Co., Inc., Beaverdale, Czecho-Slovakia, 519 bls. wood pulp.

Aetna Paper Co. Completes Smoke Stack

DAYTON, Ohio, November 25, 1935—Towering 250 feet from the ground up, Dayton's highest industrial smoke stack has just been completed at the plant of the Aetna Paper company on Columbia street. The next highest is 25 feet below that mark.

The stack, built of concrete and brick by the Rust Engineering company, of Pittsburgh, is part of the extensive improvements by the Aetna company in the enlargement of its plant. It measures 17 feet in diameter at the base and 12 feet at the top and rests on a foundation 17 feet in diameter and sunk 12 feet into the ground.

With the completion of the huge stack, work will proceed on raising the power house from a two to a three-story height and installing two new boilers, contract for the boilers having been let to the Combustion Engineering company, New York. Cost of the improvements now under way is given as about $225,000. The work is under the supervision of W. I. Barrows, engineers.

Crane Appoints New Advertising Manager

The Crane Company, Chicago, announces the appointment of H. H. Simmons as advertising manager, effective November 15. In co-operation with other aids to selling, such as exhibits, dealer service, special campaigns and sales training, he will develop the advertising service so that it can be fitted into the general sales promotion program. To take up his new responsibility, Mr. Simmons terminates a nine-year association with Russell T. Gray, Inc., Chicago advertising agency, of which he has been vice president and account executive.

Mr. Simmons goes to his new position with a broad training in advertising—particularly in the industrial field. After graduating from the University of Illinois in civil engineering, he spent the first years of his business life in the trade publication field, serving successively as associate editor, advertising representative and business manager. His most recent activity has been in the advertising agency field, both on general accounts and in specialized service to industrial advertisers. Among the markets which he has had opportunity to study intensively are power plant, oil and gas, railroad, chemical, food, municipal and construction. This experience fits him admirably for his new duties.

Austrian Paper Cartel Established

Of outstanding importance to the domestic industry was the establishment of the Austrian paper cartel on July 21, according to reports from Commercial Attache Gardner Richardson, Vienna. This cartel numbers in its membership all paper manufacturers, with the exception of manufacturers of newsprint, who are united in the "Osterreichische Papierfabriksverband G.m.b.H." The latter association, which was established in 1909, regulates prices and sales of newsprint both on the domestic and foreign markets. The new paper cartel will regulate the production of all Austrian manufacturers of paper with the exception of newsprint, as well as sales and prices on the domestic market. Prices quoted on most types of paper increased after the establishment of the cartel, the increases varying between 15 per cent and 25 per cent, wholesale. Although the new paper cartel regulates sales on the domestic market only, it can be expected to have an influence on Austrian paper exports. Prices quoted on paper for export to most European markets have so far not been reduced, but new offers to overseas markets are lower for some types of paper, particularly those made from natron pulp.

The outlook for the paper and pulp industry is still uncertain. The conclusion of the paper cartel will undoubtedly help Austrian exporters to expand their foreign sales. On the other hand, the international situation has already unfavorably influenced and will probably further handicap Austrian exports. Insurance rates on freight have already been increased, especially for transportation in the Mediterranean, and a number of overseas customers who formerly purchased f. o. b. Trieste, the nearest seaport for Austrian exports, are beginning to request offers f. o. b. Hamburg or other European seaport. This naturally entails higher overland freight rates, and adds another difficulty to Austrian export business. Domestic sales are expected to increase as soon as the paper stocks in the hands of traders and the consuming industries are exhausted. Special efforts are being made to promote the use of paper sacks for the packing of foodstuffs, particularly cereals, sugars, and salts, in the place of those manufactured from textile fabrics.

Paper and Supply Company Chartered

[FROM OUR REGULAR CORRESPONDENT]

FALL RIVER, Mass., November 18, 1935—The Fall River Paper and Supply Corporation has been incorporated. The capital consists of 100 Class B and 100 common shares of no par value. Morris Horvitz, 96 Fourteenth street, Fall River, is president and treasurer, and the other incorporators are Morris Horvitz, Jr., and Dora Horvitz.

Allen Paper Machinery Dissolves

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., November 18, 1935.—A certificate of voluntary dissolution has been filed under state laws by the Allen Paper Machinery and Engineering Works of this city. The company recently suspended operations after operating here for a few years. The principal stockholders were Carlton H. Allen, Harold D. Wells and Viola H. Wells, all of this city.

1864 1935

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OVER 60 MODELS OF PAPER BAG
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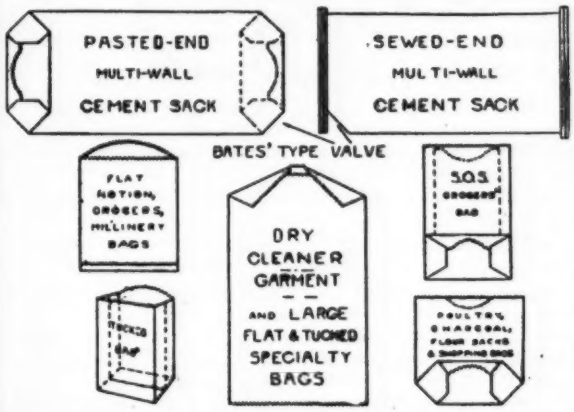

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TICONDEROGA MACHINE WORKS
Ticonderoga, N. Y.

LATEST MARKET REVIEW

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, November 27, 1935.

Business in the local paper market continues active. Demand for the various standard grades of paper is persistent. Sales forces of the leading paper organizations are booking a good volume of orders for future delivery. Prices are holding to previously quoted levels, in most instances.

The position of the newsprint paper market is practically unchanged. Newspaper advertising lineage is running ahead of last year's record. Production in the United States and Canada is being maintained in sufficient volume to take care of current requirements. The price situation is unsatisfactory.

Demand for the various grades of fine paper is brisk, including book, bond, ledger and cover papers. Prices are holding to schedule. Tissues are moving in good volume. The coarse paper market is steady, with wrapping paper in excellent request. No radical changes are reported in the paper board market.

Mechanical Pulp

The ground wood pulp market is steady. Manufacturing operations in North America and abroad are practically keyed to consumption and accumulations at the mills are not excessive. Inquiries for future delivery are fairly numerous. Prices are holding up well and reports of concessions are infrequent.

Chemical Pulp

Conditions in the chemical pulp market are improving. Demand for domestic and imported bleached sulphite pulp is better. The kraft pulp market is firmer. Foreign kraft pulp No. 1 is now quoted at from $1.75 to $1.85 per 100 lbs., on dock, Atlantic Ports. Domestic kraft pulp is selling at from $1.75 to $1.80, f.o.b. pulp mill.

Old Rope and Bagging

The old rope market is showing signs of improvement. Demand for foreign and domestic old manila rope is more active, and with offerings limited, prices are firmer. Mixed strings are steady. The bagging market is displaying a strong undertone. Scrap and gunny bagging are in persistent request.

Rags

Paper mill demand for domestic rags is improving. New cotton cuttings are moving freely, especially No. 1 white shirt cuttings, which are attracting both domestic and export interests. Prices on this grade are decidedly firm. Domestic roofing rags are in seasonal request. The imported rag market is unchanged.

Waste Paper

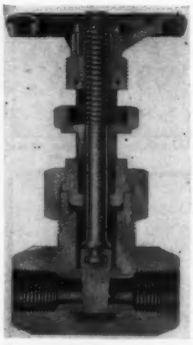
The paper stock market is steadier than of late. Board mill demand for the lower grades is more in evidence, especially for strictly folded news. The higher grades of waste paper are firm. Hard white envelope cuttings and hard and soft white shavings are displaying strength. Other grades are steady.

Twine

Trading in the local twine market is brisk. With wrapping paper going forward in good volume, the various varieties of twine are benefitting materially, as usual at this time of year. Quotations on hard and soft fiber twines are holding to the advanced levels recently recorded and the future outlook is promising.

New Chapman Valve

A new gate valve, machined from solid steel bar stock and carrying a 5-year guarantee, is now being introduced by The Chapman Valve Manufacturing Company, Indian Orchard, Mass.



The new valve, List 960, is made in all standard sizes from ¼ to 2 inches. It is designed for all services up to 600 pounds pressure at 800 deg. F. Sizes ¼ to 1 inch are designed for cold working pressures of 2500 pounds; larger sizes for 1500 pounds.

It is stated that the new valve offers economies not only because of its wearing qualities and freedom from repairs, but also because it can be employed as standard small-valve equipment throughout a power or process system, eliminating the need of stocking a variety of types.

Unlike the globe valves it is expected to replace, the List 960 has no pockets, raised seats or constrictions; in the open position it forms a vertually unbroken continuation of the pipe line. It can be repacked under pressure.

The valve is fitted with stainless steel valve stem, plug and seat rings. These parts are easily renewable. The unconditional guarantee which accompanies each valve states that the company "agrees to replace without charge any working part or parts of any valve which fails from any cause within five years from the date of installation."

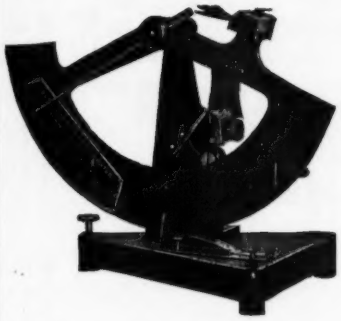
For extreme corrosive service the List 960 is manufactured in monel, stainless and other special alloys. Complete information may be obtained from the manufacturer.

SKF Ball Bearing Fan and Blower Boxes

. How S K F Bearings can replace plain bearings on fans and blowers is explained in a new bulletin, "SKF Bearings and Housings for Fans and Blowers," issued by SKF Industries, Inc., Philadelphia, Pa.

Types of fans, shaft diameters and other designations for 86 actual changeover jobs are given, and on the fourth cover is a convenient form for information to simplify changing over to SKF adapter mountings, cut sleeve mountings, knee type boxes, fan boxes, and knee type blower boxers.

ELMENDORF TEARING TESTER



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The Elmendorf Tester determines the tearing strength of paper and like materials by measuring the actual work required to effect a tear. The slightest variations in strength are detected and indicated instantly on the scale of the Elmendorf Tester. Every test is a precision test.

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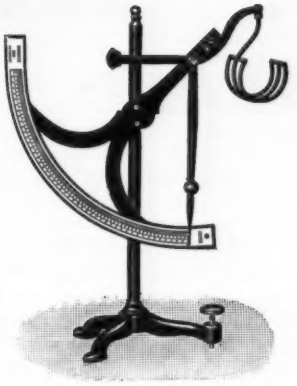

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Mills working long fibre stock like the new S.W.W. abrasive-steel combination bed plate. Others get best results with the S.W.W. diamond pattern; still others use the one on the right—the S.W.W. standard elbow pattern. Also builders of plates to customer's designs and specifications.

Beater bars in various patterns, including bars to user requirements out of carbon, alloy steels, stainless steel and bronze.

Also manufacturers of trimming knives, chipper knives, Dayton roll bar grinders, Dayton abrasive wheels, etc.

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• for every refining problem, for all grades of paper stock. Exclusive features provide increased efficiency and important operating economies.

APPLETON *Calender* ROLLS

• built to fit production requirements and to meet exacting operating demands, Appleton Calender Rolls give unusually long service.

THE APPLETON MACHINE COMPANY • Appleton, Wisconsin

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, November 27, 1935.

BLANC FIXE.—Conditions in the blanc fixe market are fairly satisfactory. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market continues firm. Shipments against contract are moving regularly. Orders are being booked for 1936 at the higher prices announced. Bleaching powder is quoted at $1.90 to $2.15 per 100 pounds, in drums, at works.

CASEIN.—The casein market is strong. Domestic standard ground is quoted at 15 and finely ground at 15½; Argentine standard ground at 14¾ and finely ground at 15; French standard ground at 15 and finely ground at 15½ cents per pound, in bags, car lot quantities.

CAUSTIC SODA.—Steadiness prevails in the caustic soda market. The contract movement is seasonal. Prices remain steady and unchanged. Solid caustic soda is quoted at from $2.60 to $3.10; the flake and ground at from $3 to $3.05 per 100 pounds, at works.

CHINA CLAY.—The china clay market is fairly active. Contract shipments are moving in good volume. Prices remain unchanged. Imported china clay is quoted at from $13.50 to $21 per ton, ship side; domestic paper making clay at from $6.50 to $12 per ton, at mine.

CHLORINE.—Business in the chlorine market is brisk. A good number of orders are being looked for next year at the higher prices announced. Chlorine is selling at from $2 to $2.40 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is irregular. Paper making gum rosin is quoted at $4.50 and wood rosin at $4.75 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $2.60 per 100 pounds, in tank cars, at works.

SALT CAKE.—Demand for salt cake is persistent. The contract movement is fairly heavy. Prices are firm. Salt cake is quoted at from $12 to $13; chrome salt cake at from $11 to $12 per ton, at works. Imported salt cake is selling at from $12 to $13 per ton, ship side.

SODA ASH.—The soda ash market is exhibiting a strong undertone. Contract shipments are moving freely. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; in barrels, $1.50.

STARCH.—Most of the business transacted in the starch market of late was routine. Another price reduction has been announced. Special paper making starch is now selling at $3.29 per 100 pounds, in bags; and at $3.56 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is displaying strength. Shipments against contract are moving at a good pace. Commercial grades are quoted at from $1.35 to $1.50; and iron free at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts, and at $20 per ton on any smaller quantity over that period. On spot and nearby carloads, the quotation is $21 per ton.

TALC.—The position of the talc market is practically unchanged. Prices are generally maintained at former levels. Domestic talc is quoted at from $16 to $18 per ton, at eastern mines, while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

PAPER

Rag Content Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
100% Rag Ext. No. 1	.36	.37
100% Rag	.28	.29
75% Rag	.21	.22
65% Rag	.18	.19
50% Rag	.15	.16
25% Rag	.12½	.13½

Sulphite Bond & Ledgers—Delivered Zone 1

	Bonds	Ledgers
No. 1 Sulphite	7.75	8.75
No. 2 Sulphite	6.75	7.75
No. 3 Sulphite	6.00	7.00
No. 4 Sulphite	5.50	6.50

Book, Cased—		
S. & S. C.	5.35 @	5.75
S. & S. C. Litho.	5.60 @	6.00
M. F.	5.10 @	5.50
Coated and Enamel	5.90 @	6.55
Coated Litho	5.90 @	6.55
Tissues—Per Ream—		
White No. 1	.77¼ @	.82½
White No. 2	.60 @	—
Anti-Tarnish M. G.	.67½ @	—
Colored	.80 @	—
Kraft	.67½ @	—
Manila	.60 @	—
Manila—		
No. 1 Jute	9.00 @	9.25
No. 2 Jute	7.75 @	8.50
No. 1 Wood	4.00 @	5.25
No. 2 Wood	3.50 @	4.00
Butchers	4.00 @	4.50
Fibre Papers—		
No. 1 Fibre	4.25 @	5.50
No. 2 Fibre	4.00 @	4.75
Common Bogus	1.50 @	3.00
Screenings	2.50 @	3.50
Glassine—		
Bleached	.11 @	—
Unbleached	.09 @	—

(The following Quotations are Delivered New York)

News, per ton—		
Roll, contract	40.00 @	—
Rolls, spot	40.00 @	—
Sheets	45.00 @	—
Kraft—		
No. 1 Northern	4.12½ @	4.75
Standard	4.00 @	—
Southern	3.87½ @	—
Boards—per ton—		
News	39.00	@41.50
Chip	37.50	@40.00
Sgl. Mla. Ll. Chip	42.50	@45.00
Jute Lined Chip	42.50	@45.00
Kraft Liners	52.50 @	—
White Patent Coated	55.00	@57.50
Binders Boards	67.00	@75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	21.00	@22.00
Dry	21.00	@22.00
(F. o. b. Mill)		
No. 1 Domestic and Canadian	18.00	@24.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—		
Division 1	2.60 @	2.67½
Division 2	2.55 @	—*
Division 3	2.50 @	—*
Prime Qualities—		
Class 1. All Prime Easy Bleaching	2.05 @	—*
Other Than Easy Bleaching—		
Class 2. Higher than Standard	2.00 @	—*
Class 3, Standard	1.95 @	—*
Class 4, Lower than Standard	1.90 @	—*
(On Dock, Atlantic Ports)		
Kraft No. 1	1.75 @	1.85
Kraft No. 2	1.60 @	1.70
(F. o. b. Pulp Mill)		
Kraft Domestic	1.75 @	1.80
(Delivered)		
Soda Bleached	2.50 @	—

* Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	6.65 @	6.90
Silesias No. 1	4.50 @	4.75
New Unbleached	7.00 @	7.25
New Soft Blacks	3.00 @	3.25
Blue Overall	4.75 @	5.00
Fancy	2.50 @	2.75
Washables	1.90 @	2.15
Mixed Khaki Cuttings	3.00 @	3.25
O. D. Khaki Cuttings	3.75 @	4.00
Men's Corduroy	1.75 @	1.85
New Mixed Blacks	2.50 @	2.75

Old Rags

White, No. 1—		
Repacked	3.00 @	3.50
Miscellaneous	2.75 @	3.25
White, No. 2—		
Repacked	1.75 @	2.25
Miscellaneous	1.50 @	1.75
Thirds and Blues—		
Repacked	1.75 @	1.85
Miscellaneous	1.45 @	1.55
Roofing Rags—		
No. 1	1.55 @	1.60
No. 2	1.35 @	1.40
No. 3 (bagging)	1.00 @	1.05
No. 4	.95 @	1.00
No. 5A	.90 @	1.00

Foreign Rags

New Rags

New Dark Cuttings	2.00 @	2.25
New Mixed Cuttings	1.80 @	1.90
New Light Silesias	3.75 @	4.00
Light Flannelettes	4.00 @	4.25
New White Cuttings	6.50 @	6.75
New Light Oxfords	3.25 @	3.50
New Light Prints	2.75 @	3.00

Old Rags

No. 1 White Linens	7.50 @	8.00
No. 2 White Linens	6.50 @	7.00
No. 3 White Linens	4.50 @	5.00
No. 4 White Linens	2.25 @	2.50
No. 1 White Cotton	4.25 @	4.75
No. 2 White Cotton	3.25 @	3.75
No. 3 White Cotton	2.50 @	2.75
No. 4 White Cotton	1.90 @	2.15
Extra Light Prints	2.00 @	2.25
Ord. Light Prints	1.75 @	1.85
Med. Light Prints	1.55 @	1.65
Dutch Blue Cottons	2.00 @	2.25
French Blue Linens	2.30 @	2.40
German Blue Linens	2.15 @	2.25
German Blue Cottons	1.70 @	1.80
Checks and Blues	1.70 @	1.80
Linsey Garments	1.95 @	2.05
Dark Cottons	1.50 @	1.60
Old Shopperies	1.00 @	1.05
New Shopperies	1.25 @	1.35
French Blues	2.00 @	2.25

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	2.00 @	2.10
Domestic	1.75 @	1.85
Wool Tares, light	1.70 @	1.75
Wool Tares, heavy	2.00 @	2.15
Bright Bagging	1.75 @	1.80
Manila Rope—		
Foreign	1.95 @	2.10
Domestic	1.85 @	2.00
Mixed Strings	.85 @	1.00
New Burlap Cut	2.00 @	2.25
Hessian Jute Threads—		
Foreign	2.60 @	2.75
Domestic	2.80 @	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—		
White Envelope Cuttings	2.45 @	2.55
Ordinary Hard White No. 1	2.10 @	2.15
Hard White No. 2	1.90 @	2.00
Soft White No. 1	1.80 @	1.90
Flat Stock—		
Stitchless	.65 @	.75
Over issue Mag	.65 @	.75
Solid Flat Book	.55 @	.60
Crumpled No. 1	.35 @	.40
Solid Book Ledger	1.50 @	1.65
Ledger Stock	.85 @	.90
New B. B. Chips	.30 @	.35
Manilas—		
New Env. Cut	1.70 @	1.80
New Cuttings	1.35 @	1.45
Bogus Wrapper	.40 @	.50
Old Kraft Machine—		
Compressed bales	1.10 @	1.20
News—		
No. 1 White News	1.45 @	1.50
Strictly Overissue	.50 @	.55
Strictly Folded	.32½ @	.35
No. 1 Mixed Paper	.25 @	.27½

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Twines

(F. o. b. Mill)

(Soft Fibre)

Coarse Polished—			
India	.12¾	@	.15¼
Belg. White Hemp	.13¾	@	.14¾
India Compress	.13¾	@	.13¾
Fine Polished—			
Fine India	.21	@	.23
Special	.19	@	.21
Unpolished—			
Box	.11½	@	.12
Paper Makers	.09	@	.13½
Tube Rope	.09½	@	.14½
Wall Paper	.10½	@	.14
Wrapping	.14½	@	.20½
Special	.14½	@	.15
Soft Fiber Rope	.11¾	@	.12¼

(Hard Fibre)

Bond	.11	@	.19½
Anchor	.10½	@	.12

CHICAGO

Paper

(F. o. b. Mill)

Rag Bond	.12	@	.50
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.11
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¼	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¼	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	41.00	@	—
Sheets, open	46.00	@	48.50
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.70	@	.80
Solid Books	.60	@	.70
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45
Old Newspapers—			
No. 1	.30	@	.35
No. 1 Mixed Paper	.25	@	.30
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper

(Delivered Philadelphia)

Bonds	.05-9/10	@	.38
Ledgers	.06-9/10	@	.40
Writings—			
Fine No. 3	.05	@	.06
Superfine	.10	@	.12
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Book, M. F.	.05¼	@	.06¼
Book, S. S. & C.	.05½	@	.07½
Book, Coated	.06½	@	.09
Coated Lithograph	.06¾	@	.08½
Label	.07	@	.11
No. 1 Jute Manila	6.25	@	—
Manila Sul. No. 1	5.25	@	—
Manila No. 2	3.75	@	—
No. 1 Kraft	5.00	@	—
Southern Kraft	4.75	@	—
Common Bogus	.03	@	—
News Print Rolls	40.00	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.40	@	1.75
Best Tarred, 3 ply	2.00	@	2.25

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.06¼	@	—
New White, No. 2	.04½	@	—
Light Silesias	.04	@	—
Silesias, No. 1	.04	@	—
Black Silesias, soft	.03	@	—
New Unbleached	.06	@	—
Washable, No. 1	.01¾	@	—
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02½	@	.04½
New Blue	.01½	@	—
Fancy	.01½	@	—
New Black Soft	.02	@	.03¾
New Light Seconds	.04	@	—
New Dark Seconds	1.10	@	—
Khaki Cuttings—			
No. 1 O. D.	.04	@	—
No. 2 Mixed	.03	@	.04
Corduroy	.01¾	@	—
New Canvas	.03½	@	.04¼
New Black Mixed	.02¼	@	.02½

Domestic Rags (Old)

White No. 1—			
Repacked	3.25	@	3.50
Miscellaneous	2.00	@	3.00
Thirds and Blues—			
Miscellaneous	1.50	@	1.75
Repacked	2.25	@	2.50
Black Stockings (Export)	4.00	@	4.50
Roofing Stock—			
Foreign No. 1	.90	@	1.10
Repacked	1.30	@	1.50

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	—
Domestic	1.75	@	2.00
Manila Rope	2.50	@	—
Sisal Rope	.75	@	1.00
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.75	@	1.80
No. 2	.80	@	.90
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.00	@	1.10
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.25	@	1.30
No. 1 Mixed	—	@	.75
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.00	@	1.10
No. 1 Books, heavy	.55	@	.60
No. 1 New Manila	1.50	@	—
Print Manila	.50	@	.60
Container Manila	—	@	.50
Old Kraft	1.00	@	—
No. 1 Mixed Paper	—	@	.30
Straw Board Chip	.40	@	—
Binders Board Chip	.40	@	—
Corrugated Board	.55	@	—
Overissue News	.60	@	—
Old Newspapers	.40	@	—

BOSTON

Paper

(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.07¼	@	.11
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¼	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¼	@	.05
No. 2 Kraft	.04¼	@	.04¾
(F. o. b. Boston)			
Southern Kraft	.03¾	@	.04¾
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print Rolls	39.50	@	—
Straw Board, rolls	.009	—	@35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	40.00	@	45.00
Chip Board	37.50	@	40.00
Chip Board (Creasing)	37.50	@	40.00
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated News Board (Bender)	55.00	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	67.00	@	75.00

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.00	@	2.20
No. 1 Soft White	1.75	@	1.90
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.55	@	.65
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.30	@	1.40
No. 1 Old Manila	.60	@	.65
White Blank News	1.25	@	1.30
No. 1 Kraft	—	@	1.00
Mixed Papers	.22½	@	.25
Print Manila	.50	@	.60
Container Manilas	.27½	@	—
Old Newspapers	.25	@	.27½
Overissue News	—	@	.35
Box Board Chips	—	@	.25
Corrugated Boxes	.35	@	.37½
Kraft corrugated boxes	.85	@	—
Screening Wrappers	.40	@	.45

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	2.10	@	2.25
Domestic	2.10	@	2.25
Transmission Rope	.90	@	1.00
Jute Rope	1.60	@	1.75
Jute Carpet Threads	1.00	@	1.10
Gunny No. 1—			
Foreign	2.00	@	—
Domestic	1.75	@	1.80
Bleachery Burlap	4.00	@	4.50
Scrap Burlap—			
Foreign	1.95	@	2.00
Domestic	1.60	@	1.75
Scrap Sisal	1.75	@	1.85
Scrap Sisal for Shredding	1.85	@	2.00
Wool Tares, heavy	1.90	@	2.00
New Burlap Cuttings	1.75	@	1.90
Australian Wool Pouches	3.00	@	3.25
Heavy Baling Bagging	2.50	@	2.75
Paper Mill Bagging	1.25	@	1.35
Bagging No. 2	.90	@	.95

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1	.06¾	@	.07
New White No. 2	.04	@	.04¼
Silesias No. 1	.04½	@	—
New Black Silesias	.02½	@	.03
Soft Unbleached	.06¾	@	.07
Blue Cheviot	5.25	@	5.50
Fancy	.0225	@	.023
Washable	.0165	@	.0170
Cottons—According to grades—			
Blue Overalls	5.25	@	5.50
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04¼
O. D. Khaki	.04	@	.04¼
Corduroy	.01¾	@	.02
New Canvas	—	@	.03
B.V.D. Cuttings	—	@	.06½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.50	@	2.00
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	2.50	@	3.00
Roofing Stock—			
No. 1	1.45	@	1.50
No. 2	1.25	@	1.30
No. 3	1.05	@	1.10

Foreign Rags

(F. o. b. Boston)

Dark Cottons	1.40	@	1.60
New White Shirt Cuttings	6.50	@	6.75
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.90	@	—
Old Linsey Garments	2.10	@	—
New Silesias	4.50	@	4.75

TORONTO

Paper

(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.11	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.12	@	—
No. 2 Colored	.09	@	—
Ledgers (sulphite)—			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.50	@	—
No. 2 M. F. (Carloads)	6.00	@	—
No. 3 M. F. (Carloads)	6.00	@	—
No. 1 S. C. (Carloads)	7.00	@	—
No. 2 S. C. (Carloads)	6.50	@	—
No. 3 S. C. (Carloads)	6.50	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	5.25	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft, No. 2	5.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	39.50	@	—
Sheets	44.50	@	—

Pulp

Ground wood	27.00	@	—
Unbleached Sulphite	42.00	@	—
Book (Class 1)	58.00	@	—
Writing (Class 2)	59.00	@	—
Select (Class 3)	60.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

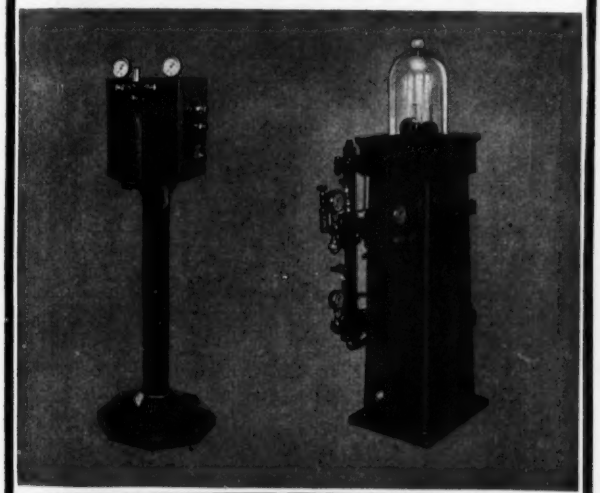
Shavings—			
White Env. Cut	2.00	@	2.25
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.40
Printed Manilas	.50	@	.60
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.55	@	—
Strictly Folded	.30	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.06¼	@	.06½
Fancy Shirt Cuttings	.02¼	@	.02½

NEW ECONOMIES
WITH
CHLORINE PLUS AMMONIA
FOR
SLIME
ELIMINATION



Chloramine—formed by controlled application of chlorine and ammonia—has successfully eliminated slime in over 200 leading paper mills—at a cost of from 1½ cents to 6 cents per ton of product.

SLIME ELIMINATION WILL:

- increase production.
- lengthen felt life.
- reduce chemical costs.
- improve paper quality.
- cut down clean-up costs.
- overcome slime breaks.
- and effect production economies that reflect in increasing profits.

OTHER W & T SERVICES
Automatic pH control
Dry Chemical Feeders
Testing Instruments for chlorine and pH
Bleach Plant Equipment

ASK FOR
Research Publication #327—"Slime in Paper Mills—Its Origin and Prevention."

WALLACE & TIERNAN CO., Inc.
Manufacturers of Chlorine and Ammonia Control Apparatus
NEWARK, N. J. BRANCHES IN PRINCIPAL CITIES

PAPER TRADE JOURNAL

ESTABLISHED 1872

SIXTY-FOURTH YEAR

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

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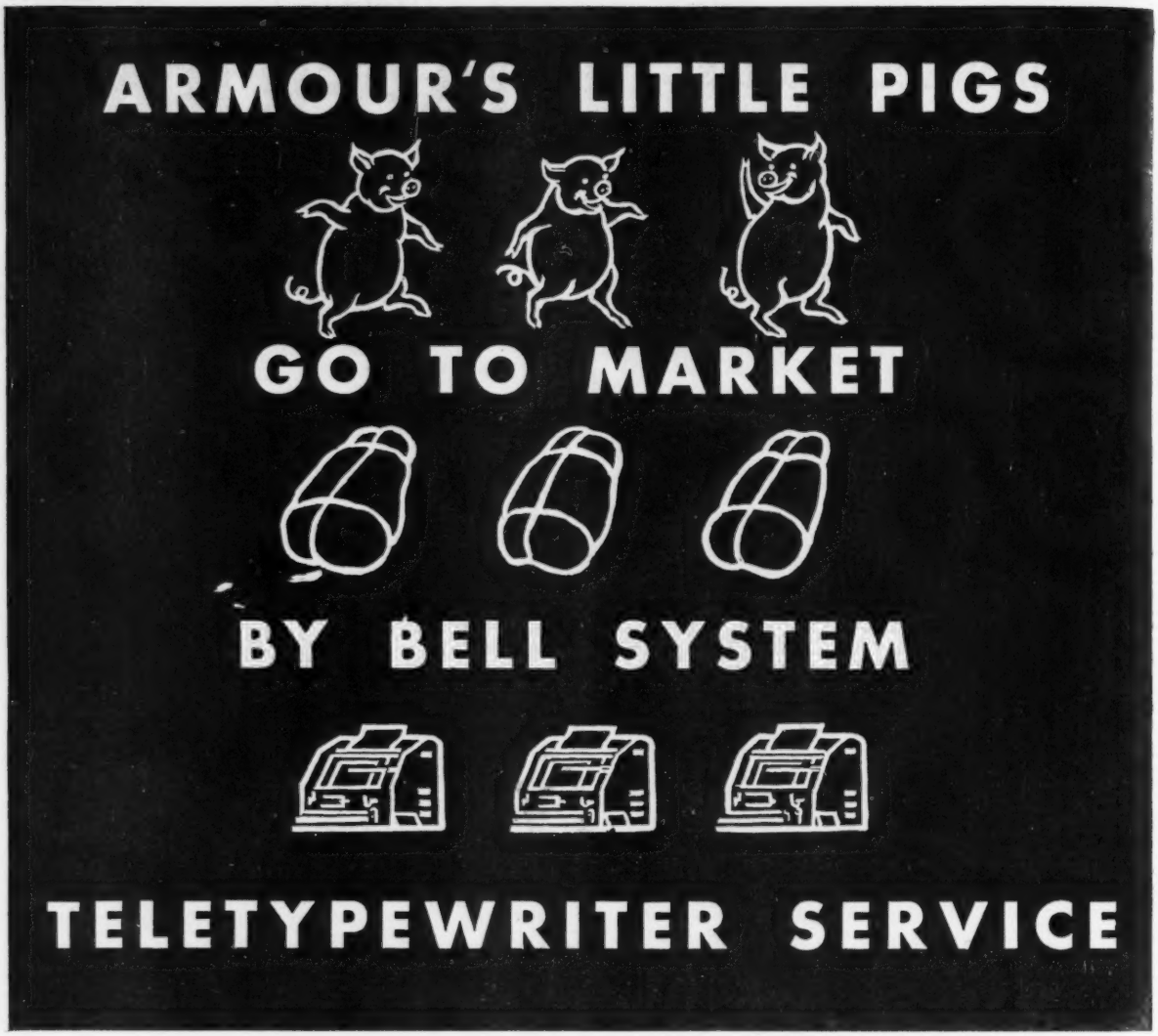

BELL SYSTEM teletypewriters connect the Chicago headquarters of Armour and Company with stock-yards, slaughtering, and production plants and district offices in twenty-six cities. Armour units in other cities are connected with headquarters by many different types of wire facilities furnished by the telephone company. This communication hook-up permits Armour to control many far-flung activities almost as if they were under one roof.

Teletypewriter Service handles slaughtering and production reports which are transmitted direct from outlying units to Chicago, these units receiving instructions in return almost instantaneously. Purchasing and production are closely co-ordinated with demand. As a result Armour gets better prices, there is less shrinkage and spoilage, and faster turnover.

District offices in major cities depend upon the teletypewriter and other Bell System facilities to send orders to headquarters, to help maintain adequate stock levels, and to report market conditions by which prices and sales policies are determined.

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